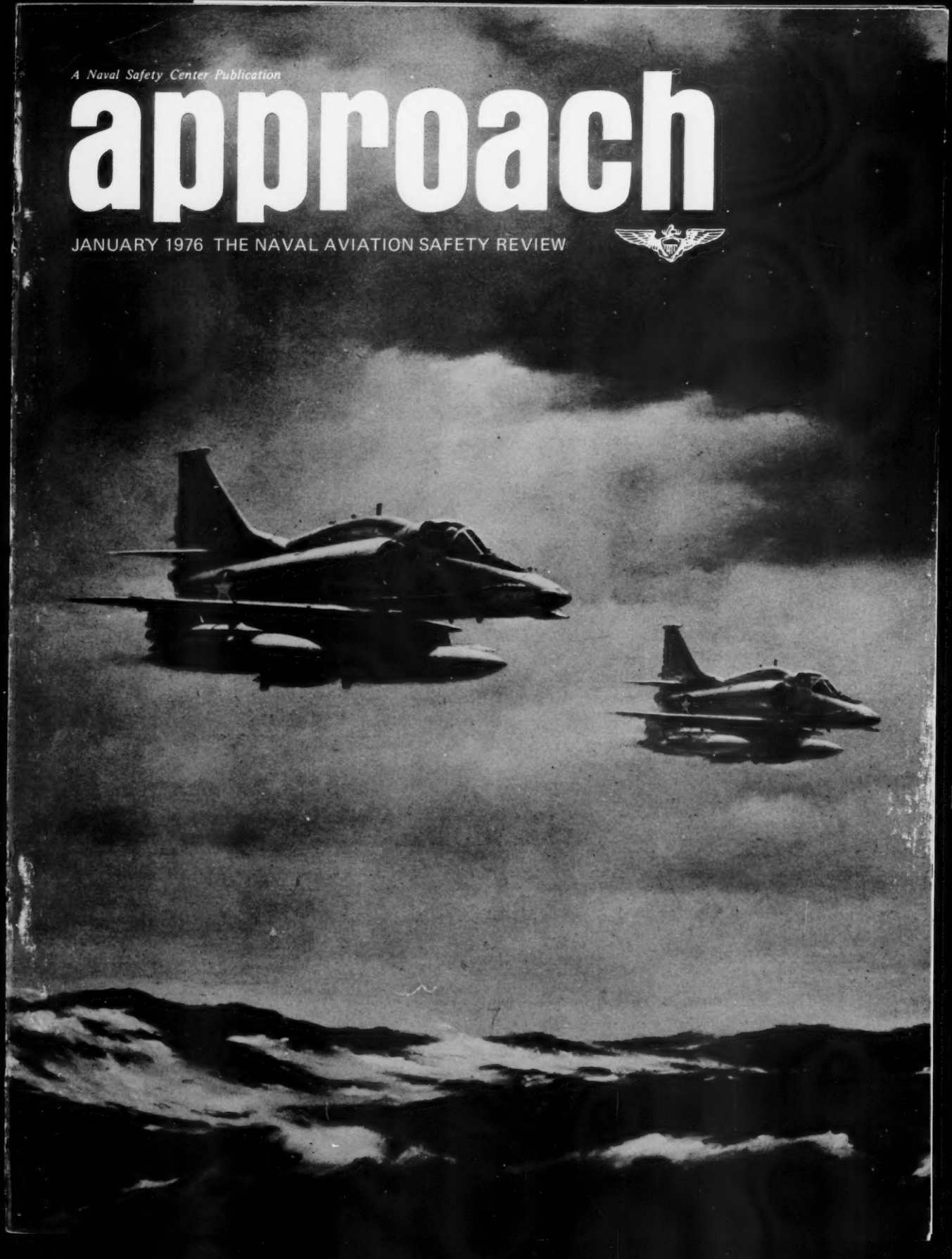
A Naval Safety Center Publication

approach

JANUARY 1976 THE NAVAL AVIATION SAFETY REVIEW



CV Safety Organization

REALITY OR

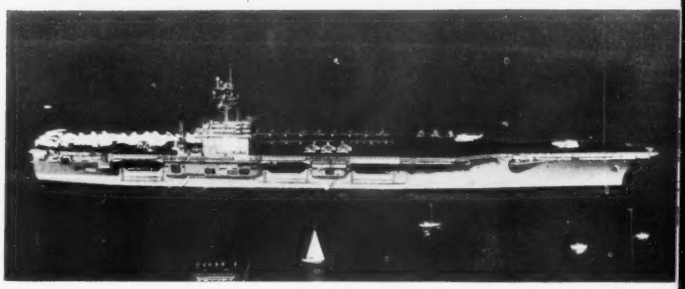
"The most serious restriction to a coherent CV safety organization is the lack of a BUPERS-recognized billet structure."

"Quality in safety is something else. It rates low in the eyes of the department heads. I normally receive any misfits or castoffs they can't use. For example, the ABE1 I had was the lowest ranking E-6 of his peer group. I finally fired him and predictably didn't get anyone back."

"This is without a doubt the most unrewarding, unpleasant, least supported, totally demoralizing job I have ever had."

By CDR H. A. Petrich
Safety Officer
USS NIMITZ (CVN-68)

LIP SERVICE



These are some of the comments resulting from an informal survey recently sent to all CV safety officers requesting information regarding today's carrier safety departments. To further indicate the attitude of some of the incumbent CV safety officers toward their present billet, and to show the low regard they think safety is given on some CVs by top management, here are a few more quotes:

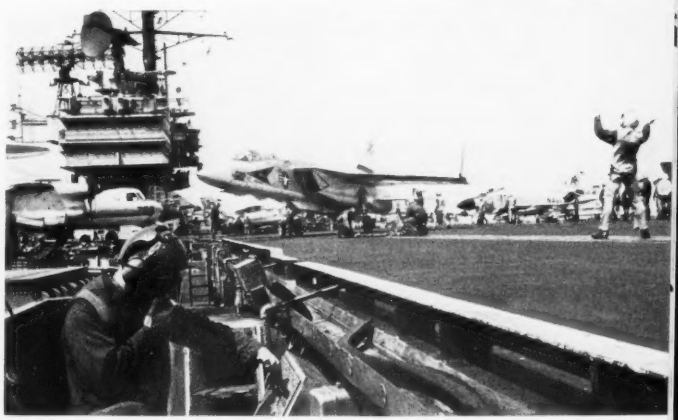
"I can only get safety members by begging."

"Although we call safety a department, it is confusing because the routing code is under the Exec as per LANT/PAC CV instructions. That needs to be changed navywide."

"Another area that has caused some problems is communications on the flight deck. Our Air Department controls all the Mickey Mouse headsets and the past three air bosses have always found some reason not to have any available for the safety team on the flight deck."

"I have an E-3 yeoman as my enlisted safety team. During flight ops there is an air wing safety observer, during deck evolutions a BM1 observer, and four GM1s TAD during weapons evolutions. I've tried to get an officer assistant but have been turned down three times by the XO."

"(My TYCOM) will not give an allowance for safety."



So what do we do with safety? Do we make it a viable program with an effective organization and thus help achieve the desired state of readiness in this era of declining material, financial, and personnel resources? Or do we merely pay lip service to the concept? If the latter, then we may as well revert to a former concept whereby each individual is his own safety observer – and whenever a safety violation occurs, blame it on misfortune. We cannot tolerate such a subjective *modus operandi.* We must have an independent organization which operates objectively, separate from any specific department, and which is directly responsible to the Commanding Officer. OPNAVINST 3120.32, Standard Organization and Regulations of the U.S. Navy (June 1974), tried to do just that by stating "in aircraft carriers

Results of Informal Safety Survey (14 Carriers Respond)

1.	2.	3./4.
Yes	Assigned to XO	1 CDR, 1 YN (collateral duty)
Yes	NA	1 CDR, 1 LCDR and 1 MMCS (3-M), 1AOC 1 BT1, 1 ABE3, 1 YN3, 1 SN 2 AO2 (TAD from air wing)
No	Exec	1 LCDR, 1 YN, 1 ABH2, 1 PR2, 1 MM2/HT2 1 BM2, 1 ET2 (Except for LCDR and YN, all personnel are TAD for 6 months. During TAD, they're shared with parent department for some duties.)
Yes	NA	1 CDR In port: 1 BMCM, 1 EM1, 1 SN At sea: 1 BM1/C, 1 EM1/C, 1 ABE1, 1 YNSN
No	Exec	1 CDR, 1 ABFC, 1 HT1, 2 ADJ1 1 PH2, 2 AN
Yes	NA	1 CDR, 1 BM, 1 ABH, 1 EM, 1 AO 1 HT, 1 YN
No	Exec	1 CDR, 1 EMC, 1 ABHC, 1 HT1, 1 SN
Yes	Enlisted assigned to X-1	1 CDR, 1 LT, 1 ABH1, 1 BM2 1 AO3, 1 YN
Yes	NA	1 CDR, 1 EMC, 1 BM1, 1 AQ1, 1 AO1 1 ABH2, 1 YN3, 3 AO (TAD from CVW)
No	Exec	1 CDR, 1 CPO plus reps from Air, Deck, Engineering and Weapons, 1 YNSN
Yes	NA	1 CDR, 1 GMTC, 1 AO1, 1 AO2, 1 HT1, 1 ABH2, 1 YN3, 1 SN
Yes	NA	1 CDR, 1 LTJG, 1 AOCS, 1 AO3, 1 YNSN. (When at sea, 2 E-4s from Air and 2 E-4s from CVW assigned TAD.)
No	Admin	1 CDR, 1 YNSN
No	Admin	1 CDR, 1 ABCS, 1 HTC, 1 AO1, 1 MM1, 1YN3

Fig. 1

there should be a safety department." This statement is followed by an organizational chart which shows safety to be a CV department.

One year after this instruction became effective this author surveyed all CV safety officers as to how this concept was being implemented. Of the 16 CVs in commission at that time, replies were received from 14. The answers to the survey questions are partially shown in Fig. 1. The results show fairly accurately the priority safety receives from the Navy's shipboard aviation community. All safety officers indicated that they literally had to beg for an onboard enlisted team, and the members were often the bottom of any given rating. Of interest is that one CV has an O-4 safety officer, two CVs have a safety organization with only the safety officer and a yeoman, and a fourth CV has an enlisted team which operates from the flight deck and hangar deck exclusively.

Organization is not an end to itself. However, it is the basic building block from which any unit begins its operations and whereby it can function effectively, efficiently, and professionally. This basic tool is necessary in our CV safety makeup. To be effective and credible, the safety inspector must be a high quality individual. It is counterproductive to use a castoff as a safety inspector. His results will be of minimal quality, and *that* association with safety by all hands can only achieve results other than intended. The Navy, from its

Informal Safety Survey

1. Do you have a safety department onboard?
2. If no safety department, what department, if any, do you belong to?
3. If no allowance, who is on your safety team and how do you procure your people?
4. How much of your allowance do you actually have onboard?

ABOUT THE AUTHOR

CDR Horst A. Petrich does not fall into the category of the CV safety officer that has "little or no CV experience." Starting his Navy career in P-2s, CDR Petrich transitioned to VS and the tailhook community during a tour as safety officer of VS-36. After a year at Postgraduate School, CDR Petrich gained further shipboard experience as Assistant CATCC Officer of USS ESSEX. His subsequent shore duty tour kept him in touch with CV operations as he filled the CV Ship Ops billet at CNAL Staff. From there he was transferred to VRC-40 as XO and CO. Here CDR Petrich gained further exposure to CV ops flying in support of AIRLANT carriers. CDR Petrich assumed his present duties as NIMITZ safety officer in July 1974.

planners and detailers in Washington, through the fleet commanders, type commanders, and down to the individual ship commanding officers must make a thorough reevaluation of their perspective toward the carrier safety organization if they are serious in their goal of "Readiness through Safety."

Today's CV safety officers, though mostly aviation command qualified, are generally assigned from the nonoperational (miscellaneous) aviation community, with some in these billets possessing little previous or current CV experience. It is hard to convince ex-COs from operational communities to serve as CV safety officers, since the promotion record of CV safety officers is discouraging. This is often caused by fitness reports which do not reflect head of department status and because the efforts of safety officers, unlike almost any other head of department billet onboard a CV, are not immediately evident. (When there are long stretches of accident-free periods, who gets credit? If a mishap occurs, who's on the carpet?)

Many CV safety officers are not held in the same category as heads of department by their commanding officers. A case in point is the myriad tasks most safety officers are assigned, making their safety function seem simply a collateral duty. For example, one current safety officer, in replying to this survey, listed his duties during a recent deployment as follows:

(1) COD Pilot

(2) Charter Flight (Early Bird) Coordinator

(3) Maintenance Manager for Impending SRA

(4) Investigator for Two Formal Article 32 JAG Investigations

(5) Tour Coordinator (three separate occasions)

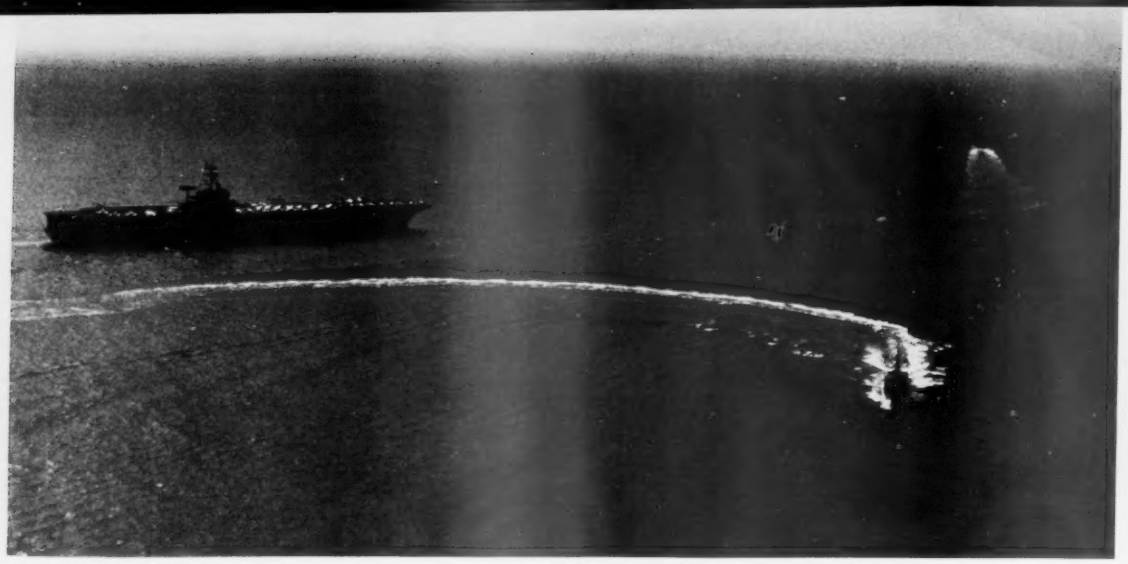
(6) Safety Officer

It is thus little wonder that very often a sour attitude, poor motivation, and a resultant lack of major league performance follow. Hence, a poor fitness report followed by failing promotion. And since this evolution is being observed by peers and subordinates as well, the credibility of safety suffers.

So what do we do with safety? We have to have the independent organization to which I referred previously. To accomplish this, certain firm actions have to be taken in addition to the ones already in existence. These include:

(1) OPNAVINST 3120.32 has to be revised to show a requirement (instead of only a desire) for a CV safety department.

Continued



(2) BUPERS must allow for an enlisted safety billet structure. This should include, as a minimum, E-6s or above in the following ratings: AB, AO, AT/EM, HT, BT/MM, and BM. (In CVNs, the MM has to be nuclear qualified.) Of these, at least one should be an E-8 to act as assistant safety officer if no officer allowance for an assistant exists. A YN (E-4 or above) must also be included.

(3) BUPERS restrict selection of CV safety officers to those ex-aviation squadron commanding officers whose commands operated from CVs.

(4) Fleet and type commanders must insist on establishing and periodically monitoring CV safety departments. To help implement this departmental concept, there have to be provisions for a safety department in the LANT/PAC CV ship instructions, including an outline of the required billet structure, a requirement for an administrative inspection, type commander initiated CV safety officer meetings on a scheduled interval, etc. These safety officer meetings (and subsequent reports thereof) should be above and beyond the weekly safety summaries or quarterly commander meetings. A "community" attitude must be fostered. Strength by numbers often leads to desired results where the separate efforts of one or two individuals to achieve the same goal may fail.

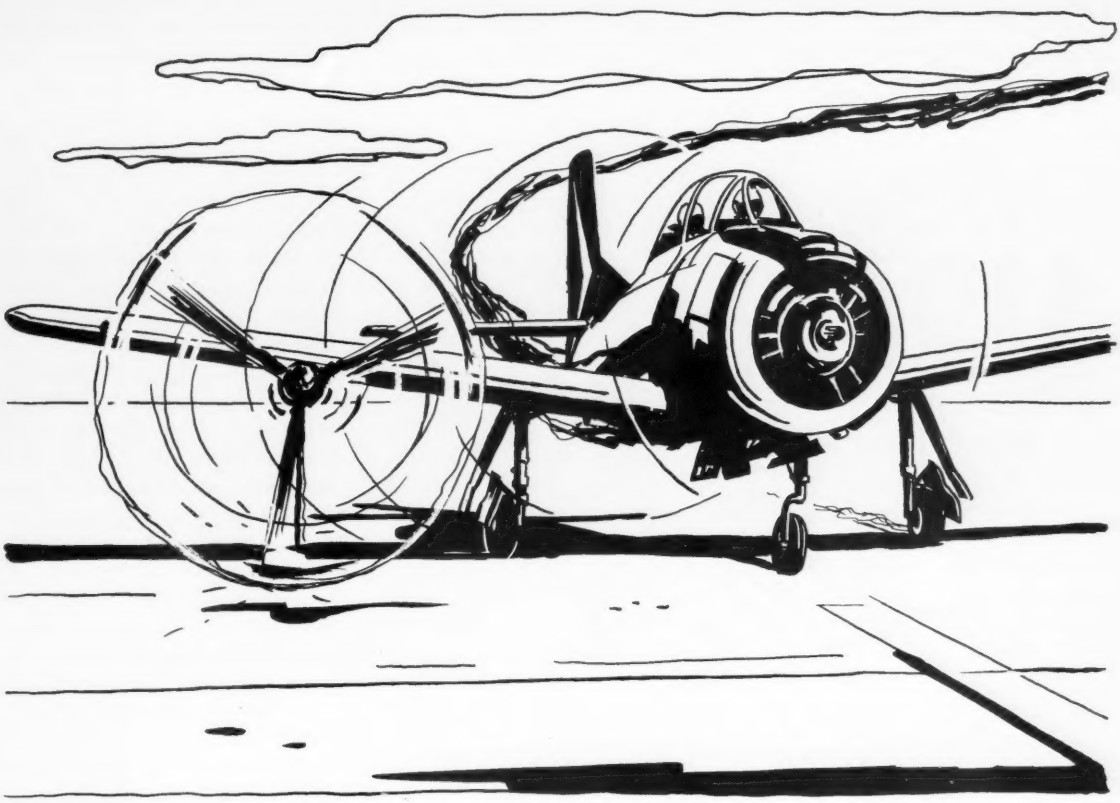
(5) Establish a shipboard requirement that individuals assigned to the safety department (other than officers and yeomen) have been onboard for at least one year, have at least one year of service remaining onboard the ship, be permanently assigned to the safety department unless promoted or transferred from the ship, and be of such quality that they can be selected by the safety officer as one of the top 3-4 men in any specific rating. To do otherwise would undermine the credibility and effectiveness of any safety organization.

USS NIMITZ, by implementing this recommendation, has proven that this concept is workable and that it's sound. The added benefit of high visibility, outstanding evaluations, and resultant promotion for the enlisted safety team members are advantages which, although not anticipated, nevertheless resulted. Three promotions for three eligibles, including one promotion to warrant officer, are NIMITZ's track record to date. This is the type of exposure safety needs.

These recommendations are not easy to implement, but they must be undertaken if the safety department is to be a meaningful tool in our quest to prevent accidents. To do otherwise is to slide into an inefficient and unprofessional carrier aviation organization. ◄

Safety Center Comment

Commander, Naval Safety Center heartily concurs with the author's premise that the CV Safety Department can become a more effective tool through improved organization and an improved personnel program which attracts the highest quality personnel through greater professional opportunities. He most emphatically states, however, that this should in no way cast any shadow on the many dedicated CV safety personnel who are presently doing an outstanding job, often under the most trying of circumstances.



Trojan Trauma

ON a basic instrument flight at 14,000 feet, a student (ENS Stanley R. Rodman) and his instructor (LT Dennis K. Collier) experienced an intermittent sump warning light in their T-28. The instructor noticed the oil pressure falling rapidly to 10 psi, the prop going to 2700 rpm, and a steady sump light. LT Collier took control of the aircraft and headed for NAS Corpus Christi. He notified the tower and declared an emergency, stating his intentions to shoot a precautionary approach.

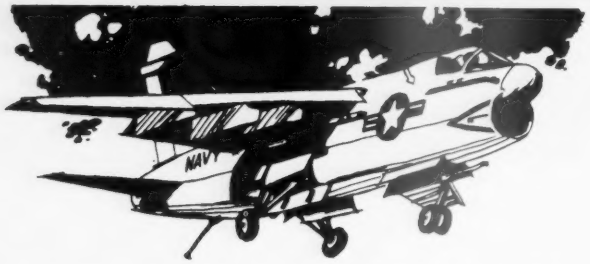
The instructor shifted to low blower passing 10,000 feet. Passing 8000 feet, the aircraft started vibrating severely. The vibrations subsided slightly but again became severe approaching high key. At approximately 3000 feet (according to the student's later recollection), there were several loud pops and the RPM began unwinding.

LT Collier reported high key to the tower, noted severe vibrations, and stated that his engine had quit. The tower replied that the aircraft was trailing smoke. LT Collier secured the fuel control and lowered gear and flaps at the 90. Without electrical power, the flaps did not extend, causing the aircraft to land long. About 2 seconds after touchdown, the propeller separated from the aircraft and came to rest on the side of the runway. The aircraft was braked to a stop, and both pilots exited uninjured.

The cause of the engine failure is under investigation.

The professionalism displayed by LT Collier and ENS Rodman in this emergency is applauded by all. Their performance is an excellent example of the value of knowing emergency procedures and then executing them to perfection. ◄

AIR BREAKS



URT-33 Problems. An aircraft crashed one night during an operational flight and the crew's rescue was delayed an inordinate amount of time because *none* of their URT-33 radios worked.

Their rescue was ultimately effected; however, it was severely hindered when they couldn't communicate. There were nine units capable of receiving URT-33 emergency signals within range at the time of the crash. The improper operation and unsatisfactory material condition of the radios resulted in an unreasonable delay in the arrival of SAR units and this delay contributed to complications of the pilot's injuries.

Investigation of the radios revealed that none of the units had had ASC 238 incorporated. This was an urgent change issued 2 years ago. ASC 238 made battery change possible at the organizational level and battery life expiration dates visible to the user. Furthermore, the survivor's radios were between 4 to 16 months overdue for inspection, and one had a leaky case seal and corroded circuit boards. Further investigation of all the squadron's URT-33 radios revealed that 29 of 42 didn't have ASC 238 incorporated, one was inoperable, two were defective, and 29 had overage batteries. That's a delta sierra!

The responsibility of overdue inspections, overage batteries, and nonincorporation of modification kits is placed on both the squadron and AIMD. All squadrons should ensure their URT-33/PRC-90s are in good working order.

Is This Trip Necessary? An aircraft crashed some months ago and there was some confusion over just where it had occurred. The duty SAR bird was launched and proceeded in the wrong direction. However, one of the survivors made it to a telephone, and notified the duty officer of the exact accident location.

The SAR helicopter pilot received the correct information and was directed to a field to pick up the survivor before proceeding to the crash site. Meanwhile, a couple of senior officers decided to "help" the SAR folks and they awaited the helo, too. When the SAR bird landed, there were too many bodies to board the helicopter.

Something had to give, so a flight-suited crewman was bumped for a VIP. Now it just so happened that the individual bumped was the duty SAR corpsman who was needed at the crash scene. When the helo reached the site, the pilot was examined and found to have facial burns, many cuts, and was dazed. The helicopter pilot quickly loaded both injured persons and took off for Homeplate. They were examined by a doctor and sent to another air station where they could get the proper medical treatment.

It's hard to understand how knowledgeable seniors could interfere as they did. What the injured needed was medical attention and not someone who was merely curious. The delay in this case did not jeopardize them, but it could have meant the difference between life and death.

True Confessions. Let me tell you how close I came to getting two for one. It was almost midnight when Ops called the line shack and told me one of our P-3 birds had landed and was taxiing in.

I went out with my wingwalker and wands to park the aircraft and was surprised to see how quickly it

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had arrived at the ramp. Usually the planes take 4 or 5 minutes after landing to reach the ramp. Anyway, I knew it would be tight, so I gave him the come-ahead, slowly.

I tried to watch both sides, but I guess I really wasn't watching either side enough. Here's what happened: the starboard wing went *under* the mad boom of one P-3; the port wing went *over* the starboard wing of another P-3.

The reason I got so lucky is that both P-3s I missed were fueled for long flights the next day and the one I directed was light and riding high – enough to allow clearance.

After I finally parked the *Orion* on the spot and the pilot secured engines, we talked about the parking. His windows were all fogged up inside and he couldn't see anything laterally. My wingwalker was distracted by having to turn off the fuel pit lights. I was at fault for not having enough people to do the job right and for not stopping the aircraft and having him towed in.

reported altitude passing, and to my surprise, I noticed he was reporting 7000 feet higher than what my altimeter was indicating! Being solid IFR in mountainous area, my attention was quickly stimulated. I called the lead, advised him of what my altimeter read, and we leveled off using my altimeter. We broke out at about 5000 feet and proceeded uneventfully to our destination. At no time did the lead get any indication of altimeter problems – everything appeared normal.

As it turned out, this incident was no real problem, but the accident potential was substantial.

(a) What if lead was on a solo flight and (b) What if the weather was IFR to touchdown? The point I'm trying to make is that operating as a section, including section takeoffs, does have its place, particularly when the naval aviation philosophy of the "buddy" system has long since proven itself. In the interest of noise abatement, however, section takeoffs are all but banned in this fighter community. The powers that be seem to think they have little or no operational value. As one who would like to have a wingman around when needed, I hope this new philosophy is shortlived.

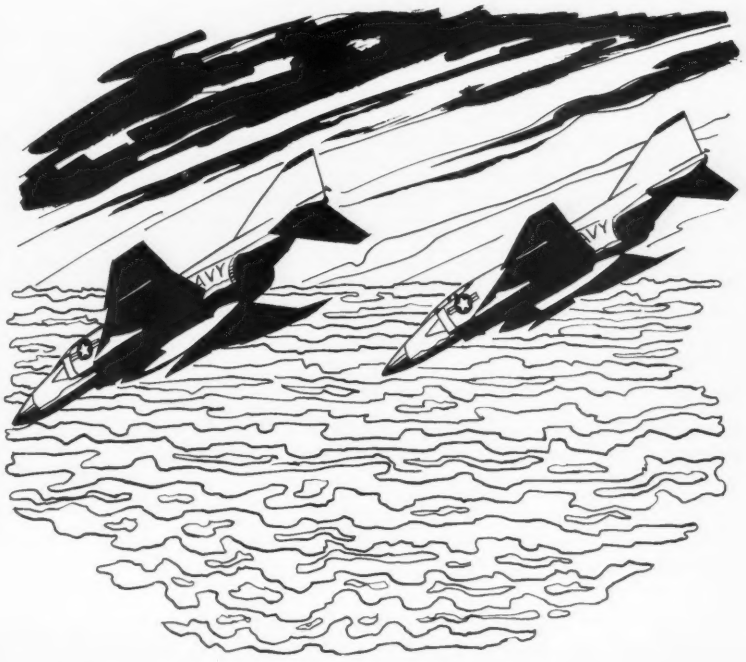
We're glad you cross-checked your altimeter during descent – not all wingees do that – their "trust" in lead is implicit.

Relative to the section bit, we couldn't agree with you more – on both the importance of having a wingman and the operational value of section takeoffs. Noise abatement is, however, a fact of life at certain high-density airports, and the Navy has a responsibility to "go along with the program." Therefore, at these noise-sensitive locations, why not make individual, short interval takeoffs, then rendezvous and proceed as a flight? Proficiency in section takeoffs can then be maintained by practicing at other fields (cross-countries, weapons dets, etc.), where noise pollution is not such a factor. ◄

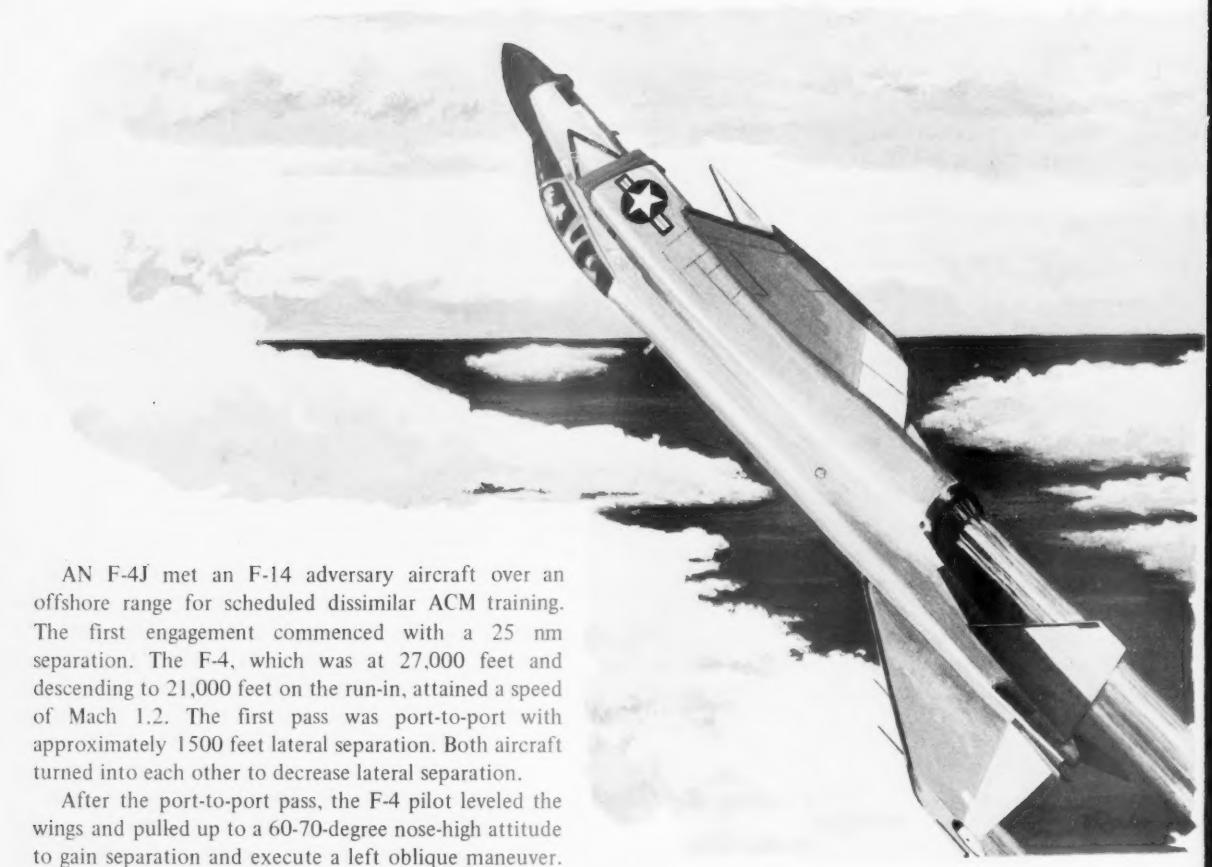
Likes Section Operations. On a cross-country flight from NAS South to NAS North, a situation arose which made all members of the flight sit back and wonder. To set the stage, weather was solid overcast for the last half of the route. The destination was in high mountainous terrain with weather approximately 5000 feet overcast, 7 miles visibility. No sweat!

Everything went beautifully until the enroute descent at destination was commenced. As wingman, I was hanging in there, anticipating penetration into the goo and monitoring communications between lead and approach control.

Lead overshot the first assigned lower altitude, but before I could give a cross-check, a further descent was issued. Upon request, lead



phantom phlameout



AN F-4J met an F-14 adversary aircraft over an offshore range for scheduled dissimilar ACM training. The first engagement commenced with a 25 nm separation. The F-4, which was at 27,000 feet and descending to 21,000 feet on the run-in, attained a speed of Mach 1.2. The first pass was port-to-port with approximately 1500 feet lateral separation. Both aircraft turned into each other to decrease lateral separation.

After the port-to-port pass, the F-4 pilot leveled the wings and pulled up to a 60-70-degree nose-high attitude to gain separation and execute a left oblique maneuver. The RIO maintained visual contact (padlock) on the F-14 which was low at his 8 o'clock position in a port turn.

While in the inverted position, the pilot commenced a starboard turn but was called to reverse port by the RIO as he was losing sight of the adversary. The pilot utilized coordinated rudder and aileron to maneuver the aircraft to port and commenced a pull of 2-4Gs that would bring the aircraft from a 50-degree nose-high inverted position down through the horizon.

Full afterburner had been selected at 15 nm separation from the F-14 on the head-on pass and was deselected as the aircraft was coming over the top in the oblique maneuver. The throttles were then retarded to a position somewhat less than full military. Passing approximately 40 degrees nose high above the horizon, inverted, approximately four loud thumps and vibrations in the airframe were heard and felt by the aircrew. Just prior to experiencing the vibrations, the RIO had transitioned from his visual of the F-14 to the cockpit mirrors to maintain padlock. At that time, the RIO noted a white vapor appearing in the engine vortices which he thought to be contrails.

Hearing the thumps, the pilot asked, "What was that?" Experiencing the airframe vibrations and seeing the white vapor prompted the RIO to call for the pilot to check for compressor stalls. Altitude at this point was approximately 30,000 feet. The pilot noted engine RPM decreasing from approximately 70 to 65 percent on both engines. The pilot immediately attempted an abbreviated airstart by pressing the engine igniters, but the airstart was unsuccessful before the generators dropped off the line. During this sequence of events, the pilot was rolling the aircraft upright, wings level.

The pilot placed the emergency RAT (ram air turbine) control handle to DOWN (RAT out) position and the port engine throttle to OFF as he commenced emergency procedures for a double engine flameout in flight. The RIO did not observe the deployed RAT

and told the pilot to get the RAT out.

When the generators dropped off the line, all power was lost, but the aircrew was able to communicate by removing oxygen masks and shouting. The pilot again physically rechecked the RAT control handle DOWN, at which time the RAT control handle separated from the RAT level arm shaft. (The most likely cause of this failure was later determined to be metal fatigue caused by corrosion and stress.)

The pilot established a 250-knot glide while attempting to deploy the RAT by replacing the RAT control handle on the broken shaft. This was unsuccessful. The pilot then displayed the RAT control handle to the RIO by holding the item over his left shoulder. The pilot and RIO discussed ejection and determined it would be necessary. The aircraft was then headed toward land in a 250-knot glide.

At approximately 10,000 feet, 220 knots, entering the overcast, the aircrew ejected. The pilot signaled for ejection by activating the eject light. The RIO initiated the command ejection sequence by pulling the face curtain. Ejection was normal, but both the pilot and RIO felt that the opening shocks were severe. After the chute deployment, the pilot noticed a tear approximately 3 feet long near the apex of his chute.

During the descent, the pilot and RIO drifted very close together. Each had deployed his raft and inflated his LPA-2. The RIO's raft became partially entangled in the pilot's shroudlines, creating grave concern for both airmen. Fortunately, pulling on the risers of their respective chutes freed the raft. The pilot then drifted down and away because of the hole in his chute. The aircrew broke out of the overcast at about 4000 feet.

During the descent, the pilot removed his gloves and oxygen mask and discarded both. Upon entering the water, he immediately released both Koch fittings, and the chute drifted clear. The LPA kept his head completely out of the water. The pilot experienced some difficulty during raft entry due to the seat pan still being attached to his torso harness (lapbelts). He solved the problem by releasing his lapbelt fittings and letting the seat pan fall into the water. The pan was still attached by the lanyard to the raft.

After entering the water, the RIO attempted to release his Koch fittings but only the right side disconnected. He removed his left glove and successfully released the left Koch fitting. The RIO entered his raft and experienced the same problem with his seat pan that the pilot had encountered. The same solution was used to rectify the situation.

The aircrew rafts were approximately 100 yards apart, enabling both visual and verbal contact. The pilot fired two pen flares to signify he was OK. The pilot deployed one dye marker and tried his survival radio. It was inoperative. The RIO's survival radio receiver was operative, but his transmissions were garbled and unreadable. The RIO, however, was able to monitor voice communications during the entire rescue.

Meanwhile, the F-14 descended below the overcast, spotted the survivors, alerted SAR, and remained on scene as SAR commander until fuel requirements forced him to pass command to a C-9. The C-9 remained on the scene until the survivors were rescued, uninjured, by a Coast Guard helo a short time later.

The cause of the accident was a double flameout and subsequent failure of the RAT control lever shaft. Although the aircraft was lost at sea, the aircraft mishap board concluded that the most probable cause of the flameout was compressor stalls. This conclusion was not arrived at lightly; in fact, the board made an exhaustive analysis of other possible cause factors, including improper programming of inlet guide vanes, variable bypass bellmouth, variable area inlet ramps, FOD, corrosion, fuel starvation, variable area exhaust nozzle failure, failure of fuel controls, and engine seizure. All of these were rejected in favor of compressor stalls as the cause factor.

The board noted that the aircraft was operating in a regime conducive to compressor stalls (low-density air), and that high angle-of-attack and rapid throttle movements caused a pressure ratio above the capabilities of the compressor section. Unfortunately, at that altitude and attitude, the aircraft was outside the airstart envelope as defined by the NATOPS manual. And, as you already know, the RAT extension handle failed, precluding a start once the aircraft reentered the airstart envelope. ◄

NO LETUP

(In Unintentional Wheels-up Landings)

IF ever a subject was old hat, this is it. APPROACH has printed numerous articles in the past on the subject, so why are we printing another? *Because unintentional wheels-up landings continue to occur with undiminished regularity!*

The accompanying chart shows the unintentional wheels-up landings of fixed-wing aircraft, by years, during the period FY-67 through April of FY-75. This includes six aircraft destroyed and 22 substantially damaged. All others received minor or limited damage. There were four major and four minor injuries during this period, which is regrettable, but considering the potential hazards, we can rejoice that there were no more injuries.

In a few cases, pilots simply disregarded the checklist and forgot to put the wheels down, but these cases are a minority. In the great majority of situations, the pilots were distracted and/or had their habit patterns interrupted by some event at some place in the landing pattern. Typical distractions are:

- Conflicting traffic in pattern.
- Excessive radio transmissions.
- Nonstandard traffic patterns (right-hand breaks, short GCA patterns, etc.).
- Unexpected waveoffs.
- Problems or emergency with some aircraft system.

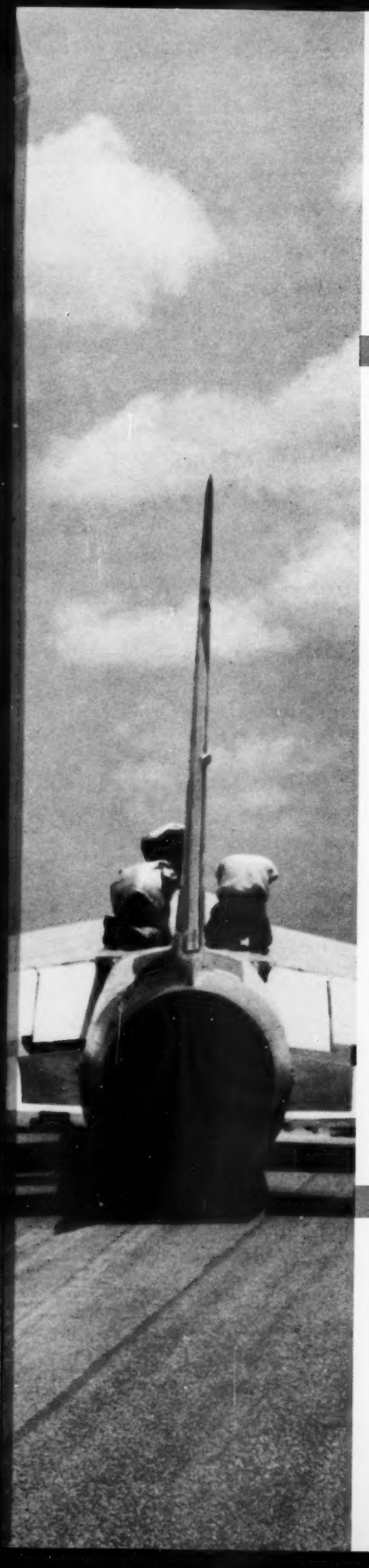
As already indicated, disregard of checklists figured directly in only a few accidents, but figured more subtly in a substantial number of other accidents. For example, the aircrew completed the checklist, but decided to "hold the gear" until reaching some particular place in the pattern . . . then some distraction caused them to forget.

There were a few cases where aircrewmen misread the indicators, thinking the gear was down when it was up. In other cases, the landing gear handle was lowered, but was not fully seated in the down detent. There were a few cases where the pilot in command was so busy giving instruction to other pilots in the cockpit that he forgot to lower his gear.

Only four out of 104 of the accidents occurred onboard ship. The reason for this is obvious; LSO, hook spotter, etc., observing on every pass. Shorebased, the T-2, T-34, and T-28 were among the best performers (one wheels-up for each 2,408,132; 407,555 and 340,280 landings, respectively). This indicates that instructor pilots, RDOs, and/or a high degree of standardization of operations (all found in the Training Command) are effective in preventing unintentional wheels-up landings. As can be seen from the rates, no firm conclusions can be drawn concerning the relative merits (or hazards) of single-place versus multi-place cockpit aircraft.

The record shows that preventing wheels-up landings is very difficult. Wheels watches, tower operators, and aircraft warning devices help, but it is the pilot who must bear the final responsibility. He should make it an ironclad rule to always use the checklist and to be wary of using any procedure such as "holding the gear."

Finally, any time there is any interruption in normal habit patterns or any other distraction in the landing pattern, he should BEWARE. This is the time to regroup and use great care to ensure that the landing gear is really down. It could save a lot of embarrassment – or worse.



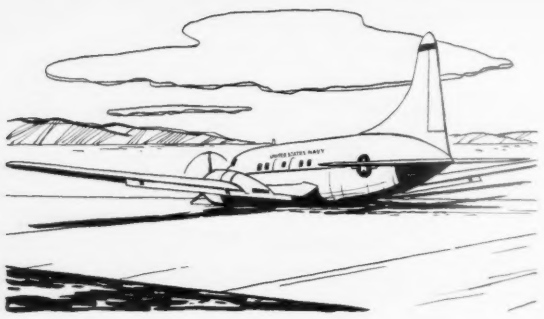
	Unintentional Wheels-Up Landings in Fixed-Wing Aircraft From FY-67 through Apr 1975										Rate of Wheels-up Landings per 10,000 Landings (Disembarked)
	67	68	69	70	71	72	73	74	75	Total	
A-1			2		1					3	.30
A-3	1	1		1	2	2		1		8	.14
A-4	4	4	2	1	1	1	2	2	3	20	.063
A-5			1							1	.07
A-6					1	1		1		3	.05
A-7			1					2	1	4	.03
C-1			1							1	.04
E-1				1						1	.06
E-2					1			1		2	.10
F-4		1			1					2	.01
F-8	2		1							3	.07
F-9	1		3	1						5	.03
F-10			1							1	.66
P-2		1				1				2	.06
P-3		1							1	2	.02
S-2	2	3	2	1	2	2	1			13	.05
T-2						1				1	.004
T-28	2	1	4				1	2		10	.03
T-33		1		1		1				3	.36
T-34	2		1				1	3		7	.02
U-3								1		1	2.2
U-11					1					1	.15
AV-8						2			1	3	.73
OV-10			4	1		1	1			7	.36
Totals	14	13	23	7	10	12	6	13	6	104	

Chart 1

NOTE

For one approach to preventing wheels-up landings, see article on following page.

Continued



Not Foolproof, but . . .

A SOLUTION to the problem of unintentional wheels-up landings has been sought for years by engineers, aviators, and many others. To date, no foolproof system has been devised; however, we have received a letter from Squadron Leader D. N. Rogers of the Directorate of Support Requirements of the Australian Department of Defense (Air Office) which offers a plan which, if not foolproof, might at least reduce the problem. He writes:

"In the course of a study on this type of accident, I obtained some statistics from the Royal Air Force, the U.S. Air Force, the U.S. Federal Aviation Administration, as well as the Australian Services and civil authorities. The majority of unintentional wheels-up landings involved multicrew aircraft. Another interesting point came to light in comparison of the statistics. An extraordinary number of accidents occurred involving instructor pilots or check captains. In these cases, multiple changes of aircraft control between pilots at a critical phase of flight led to noncompliance with checklists and subsequent no-gear landings.

"Attempts by system designers to produce a foolproof gear warning device have been largely in vain. There have been instances of pilots ignoring bells, horns, flashing lights, and landing gear up. The classic case involved a pilot who, during the postaccident inquiry, stated that he didn't hear the tower controller's warning 'cause the transmission was drowned out by the horn!

"Some years ago, all *Mirage III* fighters operated by the Royal Australian Air Force were fitted with a gear check system which has proven highly successful. In fact, it has been so effective that all RAAF aircraft with retractable gear will have the system installed in the near future. The system permits air traffic control to check that the gear is down, regardless of weather conditions or time of day, before issuing a landing clearance. Aircraft modification is very simple and inexpensive (about $200-$400 per aircraft depending on radio fit) and can be justified on grounds of cost alone, if one wheels-up landing can be prevented.

"The aircraft is fitted with a small tone generator wired to the down microswitch on the gear oleos, and connected to a small pushbutton located at a suitable place in the cockpit. The generator is not required if the aircraft is fitted with a UHF set with a built-in tone generator.

"Operation of the check system is simple. When the pilot calls base or final, he gives the normal transmission (e.g., Red One base, gear down and locked, touch and go), and when this is completed he presses the button which activates the tone generator and emits a 'beep beep' over the intercom and UHF operating frequency. When the tower operator hears the 'beep beep,' he knows the gear is down and issues the appropriate landing clearance.

"The system provides the following advantages:

- In addition to visually checking the gear position indicators, the pilot is required to make another positive physical action to *check* gear.
- It provides the crew with an aural indication that the gear is down.
- Most importantly, it permits an external agency (air traffic control) to doublecheck that the wheels are down (day, night, and in any weather) prior to landing.
- Provides a backup gear down indication when the cockpit indicators fail.

"If the air traffic controller (or crew or pilots of other aircraft in the traffic pattern) does not hear the 'beep beep,' the pilot is told to check wheels before any landing clearance is issued.

"It must be accepted that due to the human factor, some accidents are inevitable, but we can minimize the number of this classification of 'human' accident if there is some form of doublechecking and crosschecking. I believe this is a step in the right direction."

(The idea sounds great for a situation with one or two aircraft in the pattern, well spaced out. However, it doesn't seem quite so feasible when you consider a night touch-and-go pattern with six aircraft, plus straight-in GCAs and hung ordnance approaches, all requesting landing clearance within short intervals of each other. Nevertheless, the minimal cost to install the unit does seem justified since it does provide an additional safeguard. What do you think? – Ed.) ◄

Bravo Zulu

IT was 1230 local in Gaeta, Italy, when the HH-2D assigned to HSL-30, Det 31, lifted off USS LITTLE ROCK (CLG-4) to transport Commander Sixth Fleet VADM D. J. Murphy and his aide to the Naval Air Facility, Naples. The takeoff was uneventful; the climbout routine.

Fifteen minutes into the flight, LTJG Mike Connelly remarked to the HAC, LT Tom Dean, that the helo was flying smoother on that particular flight than it had in the previous 6 months. Three minutes later, the helicopter experienced a very strong thump followed by severe vibrations throughout the aircraft. LT Dean immediately looked up to inspect the rotor tip path plane to determine the source of the problem. His scan then went to the engine and transmission instruments which indicated no abnormalities.

The detachment crewleader, ADR1 Jim Bailey, had already informed the Admiral and his aide that the helo was going down and ensured that both men were securely strapped into their seats. He then threw open the passenger door and noted that large pieces of cowling were separating from the tail section of the aircraft, and that the tail rotor gearbox was shaking violently in its mounts. He immediately relayed this info to LT Dean and cautioned him against any large power corrections because of the potential of losing the entire tail rotor gearbox at any second.

LT Dean knew the wind was coming from over his right shoulder, and although he wanted to land immediately, he was forced to extend his approach several seconds to clear an Italian residential area. With a positive "gear down and locked" report from LTJG Connelly, LT Dean completed his forced landing into the wind, using as little rudder and power as possible. Several seconds after the landing and before the rotors were secured, the tail rotor gearbox separated from its mountings. The three remaining tail rotor blades damaged a large portion of the tail pylon and caused the tail rotor drive shaft to shear. The cause of the accident was failure of one of the four tail rotor blades in flight.

The flawless teamwork on the part of all three crewmen and the superb airmanship of LT Tom Dean saved five lives and one expensive Naval aircraft. Well done.

NOTE: It is officially estimated that the entire time between the initial thump and the landing and shutdown was 30 seconds.

OUT-OF-CONTROL AIRCRAFT LOSSES

IN the past 3 years (FY 72-75), 16 A-4s, 19 F-4s, and 7 A-7s were lost as a result of "out-of-control" conditions. These losses represent approximately four complete operational squadrons and a cost of about 65 million dollars – not to mention the priceless loss of aircrew life involved in these accidents. The magnitude of these losses and the need to arrest this trend precipitated an "out-of-control" conference held under the sponsorship of the Naval Safety Center. The conference included representatives from CNO, Navy and Marine Corps operational units, type commanders, CNATRA, Naval Air Test Center, Naval Air Systems Command, Naval Safety Center, and aircraft manufacturers.

Out-of-control losses in A-4, A-7, and F-4 aircraft during the above period were used as a basis for identifying the problem areas. The following is an overview of the accident source data and cause factors:

- **A-4**: Thirteen TA-4s and three A-4s were lost due to out-of-control flight conditions. Seven losses (five TA-4 and two A-4) occurred during ACM flights. During the ACM phase, every known departure was initiated from the 90-120 degree vertical attitude, zero airspeed regime. In three accidents, asymmetrical slat conditions were recorded as contributing factors. The departures from the nose-high, low airspeed condition in the TA-4 were followed by violent poststall gyrations. In two cases, the departure developed into an inverted spin. There were three reported accidents where the pilots reported some degree of restriction in their ability to handle the controls while experiencing negative G.
- **A-7**: Seven A-7s were lost during the period. Of these seven, six were A-7Es and one was an A-7B. Five of the losses were incurred by fleet replacement pilots in readiness squadrons. The altitude of initial departure was above 10,000 feet in five of the seven accidents where sufficient altitude for recovery existed. Five losses occurred during ACM flights. Results of a departure study showed that 88 percent of all A-7 pilots with over 500 hours have departed the aircraft and that 48 percent of the A-7 pilots who have departed the aircraft first did so in a readiness squadron.
- **F-4**: Nineteen F-4s were lost due to out-of-control conditions. These losses were almost equally divided between maneuvering and takeoff/landing accidents; however, no takeoff accidents have occurred since 1973. Four losses occurred during ACM flight. Four of the 19 accidents were caused by material failure, and a material failure of lesser magnitude is indicated in one-half of the takeoff and landing accidents.

Air combat maneuvering/defensive air combat maneuvering was discussed at length, as many out-of-control losses have occurred in this phase of flight. The consensus was that **ACM/DACM** is required for both combat readiness and for teaching proper handling of aircraft to obtain maximum performance. The skills learned in this phase of flight apply to all phases requiring sound basic airmanship.

Many specific recommendations were developed by the conferees. The most important of these recommendations are summarized below:

- Develop a departure training program in A-4 and A-7 readiness training squadrons.
- Correct the recurring asymmetrical slat conditions associated with present A-4 aerodynamic slats by providing a pilot-controlled slat system (to enable the pilot to lock slats in the retracted position).
- Develop and install a departure warning system in the F-4; also install leading edge slats.
- Relocate the angle-of-attack indicator (for better viewing) in F-4, A-7, and A-4 aircraft and provide an angle-of-attack indicator in the rear cockpit of the F-4.
- Develop a better negative G restraint system in all three aircraft.

Finally, it was recommended that Section IV of all F-4, A-7, and A-4 **NATOPS** flight manuals be reviewed with the aim of improving flight characteristics description during out-of-control flight, and providing a more realistic set of recovery procedures.

These recommendations are now before appropriate authority for review, comment, and recommendations to CNO on possible future implementation. ◄

A-7 Emergency Brake Problems

How long has this been going on?

By LT Carl Tankersley
VA-83

THE old proverb, "Haste makes waste," was recently confirmed again. The setting was a carrier flight deck respot on a dark, rainy night. A plane captain arrived at his assigned aircraft, an A-7E, and found flight deck personnel impatiently waiting to move the bird. Without thinking to pump up hydraulic pressure for the brake system, he immediately climbed into the cockpit in an effort to speed up the evolution. Difficulties were quickly encountered when the flight deck crew attempted to tow the *Corsair II* out of the pack, making it necessary to disconnect the tractor from the tow bar for repositioning. Using good headwork, the director asked the plane captain for a brake check; unfortunately, the director did not take time to see the negative reply.

Frantically attempting to bring the situation to another plane captain's attention, the plane captain watched the tractor being disconnected. In the interest of expediency, neither chocks nor tiedown chains were used. As is often the case, the ship had a slight list to port, and this was enough to start the aircraft rolling. Without the normal utility brake system, the plane captain engaged the emergency brakes. Although undetermined, it is highly probable that the wheels locked and the A-7 began sliding on the slippery deck, as the emergency system checked good later. While the *Corsair* was traveling across the flight deck, an outboard pylon sway brace tore open a full droptank on a KA-6D, dumping fuel on an already slick deck. The runaway *Corsair* then continued its trip toward the deck edge. Just prior to the nosewheel hitting the deck coaming, the plane captain abandoned the aircraft, suffering numerous bruises on impact with the flight deck. The excursion ended with the plane resting nose gear first in the port catwalk, forward on the angle deck. However, the outcome could easily have been a lost A-7 and a seriously injured or lost plane captain.

To prevent a recurrence of this incident, the following measures have been taken:

- The two embarked A-7 squadrons have submitted a memo to the ship's handler, describing in detail the A-7 braking system, and the problems necessitating strict adherence to established aircraft handling procedures.

- The importance of pumping brakes was reemphasized, and the plane captains were instructed not to man the cockpit until the aircraft is ready to be moved.

ROUGH INSTRUMENTS

AT midafternoon, a crew launched in their CH-46 to reconnoiter some range landing zones which were to be used for resupply of troops in the field. The area was rugged, high terrain that varied between 1000 and 5000 feet MSL. Upon completion of the initial mission, they passed over their base and requested an additional 30 minutes flight time to check weather conditions. A passenger drop scheduled earlier in the day had not been completed, and they wanted to see if the weather had improved enough to accomplish it.

The tower approved their request, and the helo crew departed with the copilot flying to see "what was what." Ten minutes later, while tooling along about 300 feet AGL, the copilot realized they were about to enter some clouds. He began a 180, intending to return to base, and while in the turn, inadvertently entered the clouds. At that point the flight was almost over.

The copilot attempted to stop his turn and begin a wings-level climb. He asked the pilot to switch to Approach Control. The copilot, in the meantime, suffered vertigo and couldn't stop the turn. The pilot then took control but fared no better as he too had a bad case of vertigo. Between them they tried to correct the helo's attitude, but the gyrations they went through varied from 45-60 degrees nose up to nose low, and their

wing position varied between 30-80 degrees left bank.

Neither pilot ever shook the vertigo, and the helicopter remained in an out-of-balance left turn. They finally broke out of the clouds almost wings level, but in a steep, nosedown attitude. Despite full up collective and full back cyclic application, there still wasn't enough time and altitude to recover. After crashing into the trees, the aircraft rolled left and came to rest on its port side. The five crewmen all exited the helo and cleared the area. They watched while most of the *Sea Knight* was consumed by fire.

Let's take a look at the background of the pilots. They were both designated HACs. One had 400 hours in the CH-46; the other had almost 1000 hours. They were both current, having flown about 90 hours each in the previous 90 days. Both had standard instrument cards. The pilot had flown 30 hours of actual and simulated instruments in the past year, and the copilot had flown 20 hours of the same.

It's best to point out that when they entered the clouds, they made things real tough on themselves, as follows:

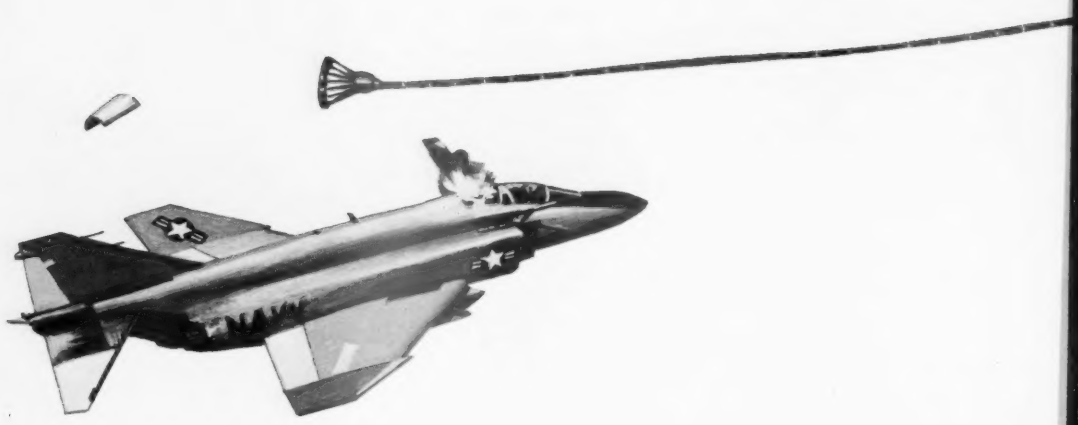
- The copilot reached across the cockpit while still flying the helo to change the TACAN from one station to another. When he straightened up and looked back at the gages, he was disoriented.
- The pilot, as requested by the copilot, changed the UHF channel, and of course had to rotate his head to do it. He, too, became disoriented.

The chances are excellent that if either one had concentrated on flying the bird, without worrying about navaids and frequencies, they'd have made it.

Another point was the failure of the copilot to slow the aircraft when he realized he was about to go IFR in mountainous terrain. They were flying at 120 KIAS, and some time still was available for him to slow down before he lost sight of the ground. Also, neither pilot realized it at the time, but the clouds had moved in behind them.

Any time a pilot suddenly finds himself on the gages and has the situation compounded by vertigo, he has real trubs, and trubs they had by the batch. Nevertheless, one of the most basic requirements for any naval aviator is to be more than just competent in flying instruments. Entering IMC (even inadvertently) should not have been sufficient reason for *two* pilots to lose control of their aircraft. The few instrument hours they had flown in the past year and their obvious lack of proficiency in instrument flying point up their need for further training and more practice in this area.

Disastrous Bingo!



AFTER two touch-and-go landings on a CVA, F-4J Modex 213 experienced a utility hydraulic failure. In accordance with NATOPS emergency procedures, the pilot pneumatically lowered landing gear and flaps. Another F-4J in the area, Modex 205, joined and confirmed gear down and half flaps; however, within 2 minutes, the trailing edge flaps blew up. Hydraulic fluid was seen along the entire bottom of the starboard wingfold area and main landing gear housing.

In this configuration, aircraft speed, less maximum available wind over deck, exceeded arresting gear limits. The CVA tower gave the F-4J a signal to divert to a shore base, indicating a heading of 062 degrees and 75 nm. Fuel state at this time was 4100 pounds. In reality, the divert field was 071 degrees and 51 miles, but this information was never passed. F-4J 205 (fuel state 4300 pounds) was directed to accompany the emergency aircraft on the divert and return ASAP.

Computed fuel (gear down, half flaps) for the bingo profile required 3900 pounds VFR, 4900 pounds IFR. Sea level divert fuel required 4800 pounds VFR and 5800 pounds IFR. *(I count two emergency divert aircraft now. – Ed.)*

The emergency F-4J commenced the divert profile with the escorting F-4J on his right wing. *Phantom* 205 assumed comm/nav lead during the profile. Meanwhile, a KA-6D tanker requested clearance to escort the flight, realizing that both F-4Js were near minimum fuel. The air boss concurred. The KA-6D, however, was unable to effect a rendezvous prior to the F-4s entering the overcast. He established a 15-degree cut during the instrument climb, intending to join above the overcast (11,000 feet), but visual contact was never established. The KA-6D proceeded back toward the ship to hold in the clear.

The F-4s made numerous attempts to establish radio

comm through published frequencies with the divert field tower/radar; none were successful. In desperation, the flight switched to Guard and managed to contact the divert field tower although radar identification was not established. A UHF/DF steer was also unsuccessful. Becoming desperate, the two F-4Js commenced a self-controlled instrument descent at divert profile pushover point (later estimated to be 4 miles from divert field). A 180-degree turn to the west was made at 5000 feet in order to remain over water and avoid known mountainous terrain near the divert field. To make things worse, visual contact was lost between members of the flight at this time.

The escort F-4J descended to VMC conditions over land and recommended a slower rate of descent to 213, which rogered. This was the last radio comm link between the two aircraft. The escorting F-4J, unable to maintain VMC, commenced a climb at this time to return to the ship. Acutely aware of his low fuel state, 205 contacted an airborne E-2C, requesting emergency tanker assistance. The aircraft was then 045 degrees/70 nm from the ship, so 205 switched to land/launch frequency and repeated his urgent request. An A-7 tanker was located overhead the ship. This tanker, under tower order to dump to landing weight, ceased dumping and departed to effect a TACAN rendezvous with 205. The KA-6D was also vectored toward 205, but the low fuel state F-4 obtained visual contact with the A-7 tanker first. Upon rendezvous with the A-7 tanker, the F-4J plugged in, but flamed out just prior to fuel transfer. The crew ejected.

Meanwhile, F-4J 213 had descended in an attempt to reach VMC underneath the overcast. He established radio contact with the divert field tower, reporting emergency fuel. Minutes later, however, 213 switched back to the ship's strike control, requesting radar vectors

back to the ship. Six minutes later, the F-4J reported zero fuel. The aircraft executed a forced landing on a farm, with *no attempted ejection by the crew.* Both pilot and RIO survived, but received major injuries.

The accident investigation revealed errors on the part of just about everyone involved in this bingo evolution. The aircrews neglected to use all available navaids to accurately determine their position. They also failed to use departure control for assistance in divert info and weather. When they could not get a TACAN lock on the field or acquire radar following, it would probably have been prudent to head back toward the ship and tank enroute rather than penetrating for an approach. It is realized that divert profiles are not designed to both proceed to divert field and return to base; however, an earlier decision to return would have enhanced chances for successful tanking for both aircraft and would have provided time/fuel for completion of a safe divert.

The decision of 213's crew to land in a field instead of ejecting resulted in major injury to the crew. The ejection seats fired as a result of ground impact, inflicting a significant portion of the injury. When later questioned, the pilot indicated he had an aversion to ejection and a strong desire to save the plane.

The decision to assign a low state F-4 as an escort also has to be questioned. The emergency F-4J had functioning comm/nav gear, and addition of the other

F-4J as escort provided no additional aircraft capabilities or pilot experience (both pilots were first tour). What's more, this complicated the divert problem. Both aircraft would have arrived with minimum fuel. Since the emergency F-4J required an arrested landing, the escorting F-4J would have had to land first to avoid a fouled runway, requiring the emergency F-4J to delay overhead – a factor not considered in the divert fuel computation. Also, why the flight was not rendezvoused with the tanker and fueled before or during divert is not clear.

The divert information given to the tower and passed to the flight by the Air Ops officer was 062 degrees/75 nm. Actual divert information to field was 071 degrees/51 nm. Divert weather which the Air officer passed to the Captain of the ship was 2500 broken, 3-4 miles visibility in rain. Forecast weather at divert field was 1000 broken, 9000 overcast, 2½ miles visibility, rain, with intermittent conditions of 1¼ miles visibility, in scattered rainshowers. Actual weather was 1500 broken, 2000 feet overcast, 3 miles visibility, rain. The TACAN at the divert field was NOTAMed down, a fact unknown to the Air officer.

When the divert evolution commenced, an E-2C aircraft was inbound to the ship from another shore station. The E-2C was directed to alert the divert field, but the E-2's effectiveness was restricted initially due to a 1500-foot max altitude limit for the air control zone they were in.

The ship's radio received the divert flight's first Guard transmission to the divert field tower. Although numerous Guard transmissions during the next 10 minutes indicated that the bingo evolution had developed into a major emergency, the only tanker under ship control was directed to recover aboard.

To sum up, there were errors by aircrew, facilities, and supervisory personnel which, in combination, resulted in the loss of two aircraft and serious injuries to two of the crewmembers. All four aircrewmen were on their first tour overseas, and none had ever before faced a divert situation into a foreign airfield. Even though this was the primary divert field and had been extensively briefed by the flight leader, air wing policy is one of diverting only if unable to effect a shipboard recovery. All this only serves to once again emphasize the hazardous nature of diverts in unfamiliar overseas operating areas and makes clear the need for careful briefing, planning, and execution of all evolutions. Specific recommendations by the mishap board included:

- Diverts be treated as serious emergencies requiring use of all available assets.
- Air Ops and air officers be constantly aware of accurate ship's position and current bearing/distance to the divert field.
- Tankers and airborne E-2 aircraft monitor divert aircraft through all frequency changes to successful landing.
- Ship/airborne radars follow entire divert evolution.
- Aircrews fully preplan divert fields using all available navaids.
- Reemphasize to aircrews of tactical aircraft the extremely hazardous nature of landing on unprepared terrain and the desirability of ejecting if the option exists. ◄

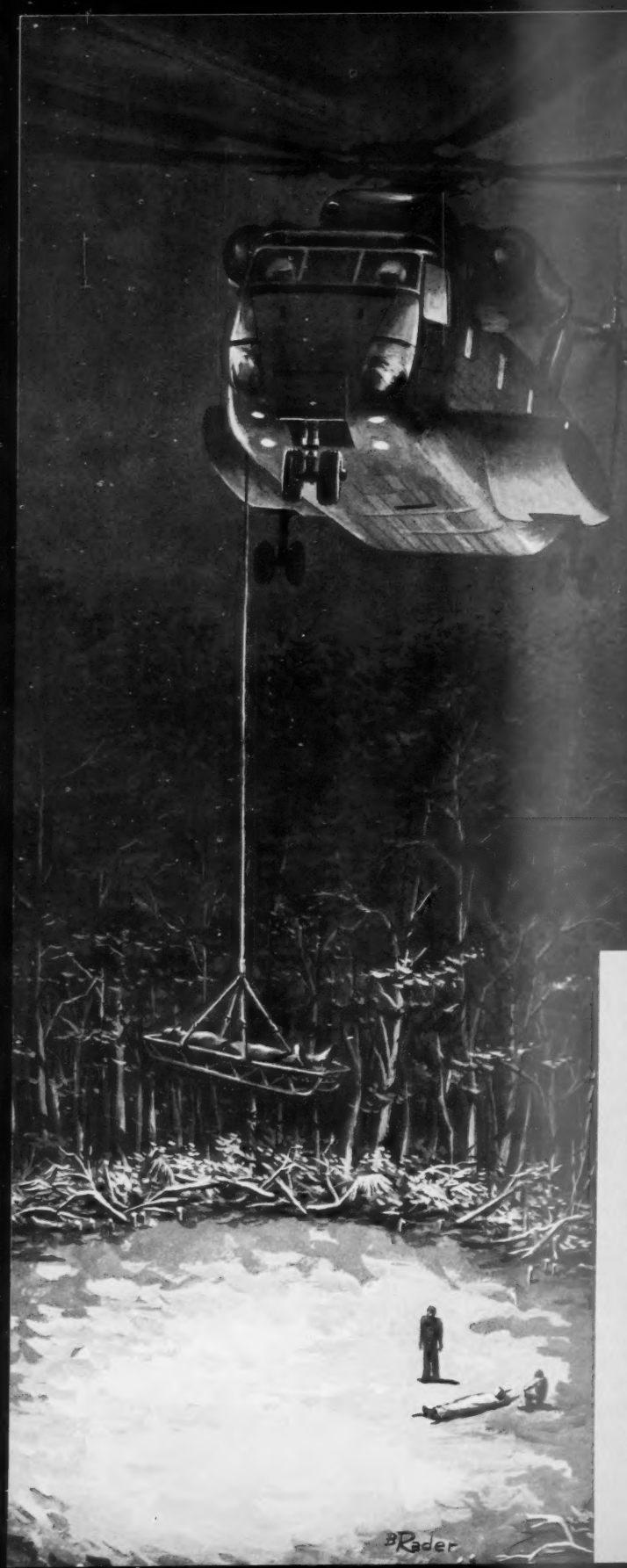
IAW NATOPS

LT Sid L. Smith and his crew of a P-3B were on an ASW exercise flight operating out of Lajes. Number 1 and No. 4 were shut down to conserve fuel. Prior to loiter, satisfactory NTS checks were completed on both engines. This was not to be a routine flight, however. About 6 hours into the flight, the chips light on No. 3 came on steady.

An immediate restart attempt of No. 4 engine was unsuccessful. When the feather button was pulled to unfeather, RPM rose to about 10 percent, but the prop refeathered. A second attempt produced similar results. A normal restart of No. 1 was then accomplished. The No. 4 E-handle was cycled and a subsequent restart on No. 4 was normal until 60 percent, at which point rapid RPM decay was noted. The No. 4 E-handle was pulled, and the emergency shutdown checklist was completed.

The PPC started back to base and closely monitored No. 3 engine during the 2-hour flight back to Lajes. The light remained on all the way, and only after landing was the suspect engine secured.

The possibility of a two-engine landing was very real. LT Smith's election to allow No. 3 to operate with a chip light on was a prudent decision and IAW NATOPS, based upon existence of a greater emergency. Factors considered by the PPC included the possible requirement to secure No. 3 if additional malfunctions occurred. LT Smith very carefully reviewed the procedures to be used for both a two-engine and a three-engine landing. His CO commended him for the correct handling of the situation and called it "professionalism in all respects." There is a requirement for all flightcrews to continually stress a review of emergency operating procedures. It paid off. ◄



SURVIVAL

FIVE crewmen were in a helicopter which crashed due to pilot disorientation upon inadvertently entering IMC conditions. After all motion had ceased, they exited the aircraft – some with help, others without. They moved away about 50 yards and watched while their big helicopter was consumed by fire. Thus began a strange series of events, delays, and booboos which weren't terminated until almost 18 hours later.

Four of the crew suffered serious injuries which included dislocated arms, pelvic fractures, broken ribs, deep lacerations, broken legs, facial cuts, and massive bruises. No one lost consciousness, but before their rescue was completed, they were all mighty uncomfortable.

The pilot of the helicopter had checked in with the tower about 1600 while passing overhead the base and received permission to extend his flight time 30 minutes. At 1645, after the tower could not contact the helo, a communications check with other fields was begun but

only negative replies were received.

About 1720, squadron officers discussed whether to launch another squadron helo on a search mission, but a decision to wait a bit was made. At 1730, 2 hours after the original takeoff, an overdue notification was prepared and released at 1800. Meanwhile, the squadron search helo was launched at 1735 but was unable to locate any wreckage because the clouds were right down to the deck. The search helo returned at 1815, refueled, and shut down, but the pilots stood by and monitored the SAR effort.

The FAA notified the Coast Guard Joint Rescue Center of the missing helicopter. An Air Force C-130 was launched, rescue services in the county were alerted, and the city police of nearby Metro were notified. During the next 3 hours, the C-130 and other fixed-wing aircraft located the general crash area, and around 2130, the word was flashed that one uninjured crewman, who had walked out, was found.

About 2145, the county rescue helicopter launched to reconnoiter the area of the crash site which had by then been pinpointed. The county helo returned and the rescuers reported they'd have to get people into the area to cut a landing site, in a fairly level spot, close by the wreckage.

Rescue personnel were airdropped an hour later with chain saws, machetes, litters, and first aid supplies. The landing site was cleared. The county helicopter landed and marked the landing zone with a spotlight. Then the chopper took off to direct rescuemen toward the crash site.

Rescuers reached the injured crewmen about 2300 but had been told by a military officer, never identified, to assist but *not* to transport or treat anyone injured until the arrival of military paramedics.

The rescuers who had worked so long and hard to reach the injured were totally frustrated and disappointed at their orders not to aid the crash victims. They were well-trained specialists who had completed a 4-month intensive medical course. All they could do was make the injured as comfortable as possible. The time was 2330.

At 0200 an Air Force CH-53, enroute to the scene, developed mechanical trouble and had to land at a civilian airport. At that time the word was passed authorizing the rescuers to get the injured out. The county helo was alerted to get 'em out, one by one, but frustratingly, another delay was encountered. The county helo incurred difficulties and had to jettison its equipment and land at the clearing.

By 0300 the H-53 was back in commission, reached the crash site after a short flight, and began hoisting the injured out. By 0530, three of the injured were in the helicopter, but then, due to low fuel state, it had to leave the scene. One paramedic and the rescuemen remained with the last of the injured, expecting the helo to return shortly. The weather, however, closed in and the last crash victim wasn't hauled out until 0930. By 1000 all of the survivors had been airlifted to a military hospital.

Let's see what was happening to the survivors all this time. They were all cold, fatigued, and hungry before their individual rescue.

After the crash, the pilot found he couldn't get out of the helo because of injuries, and the aircraft was already starting to burn. He was helped out by one of the crewmen. The copilot, who had one of the lifejackets, pulled out the radio and activated the emergency beeper. A couple of the lesser injured gathered wood to start a fire, but it was too damp and they couldn't light it.

The survivors began a self-help program and bound up each others' lacerations as best they could, using pressure bandages. Two of them set off with a compass, knife, radio, and flares to see if they could find a clearing or road. They were told to be back by dark and returned just before sunset without finding what they were looking for. They pitched in to help those who were complaining about the cold by covering them up with branches.

The injured heard an aircraft in their general vicinity about dark and eventually established communications. Their spirits were buoyed when they knew choppers would be coming. When requested, they shot off pen gun flares so the C-130 could pinpoint their position.

They first saw their rescuers about 2300 and wanted to know if the medics were coming. The rescuers told the survivors they couldn't do anything for them except to keep them warm and as comfortable as possible.

Meanwhile the uninjured survivor took off alone to continue looking for a clearing or a road, but he didn't take a radio. He had been an observer and didn't know how to operate it. This survivor was the one who was first found by the rescuers at 2130.

The rest of the story has been told. All were eventually rescued by the combined efforts of many units. They lived because they helped themselves as much as they could. They had communications, flares, and dogged determination. However, the delays between the time they were first found and their subsequent pickup could have been fatal if the crash had been in some areas of the country where temperatures were colder. The biggest hindrance in their rescue was the confusion about the order not to treat the survivors until the military paramedics arrived. First aid is exactly that, and it should be administered by the first qualified people on the accident scene. ◄

ONE PROBLEM TOO MANY

From Compound Emergency to Fatal Mishap

THE distinctive odors of the S-2 cockpit filled the young SERGRAD's nostrils as he strapped into the right seat of his TS-2A for what he thought was going to be just another routine fam hop for himself and the two students aboard. Little did he know, however, that before the flight was over he would be faced with a situation that was anything but routine. Nor did he realize that this would be his last flight.

Entering a left downward for touch-and-go landings, the instructor was jarred from the routine of the flight by the abrupt swerve of the *Tracker.* The bright red glow of the chip light on the port engine confirmed the engine problem. Reacting instinctively, the IP feathered the prop and attempted a landing approach. But in the press of emergency, he overshot and had to wave off the approach.

The aircraft leveled off at approximately 400-500 feet after overshooting the runway and proceeded up the starboard side. Upon waving off, the tower controller noticed light grey smoke trailing from the starboard engine and reported it to the pilot as the aircraft passed abeam the tower. Tower personnel observed the nosewheel to be down and mainmounts up at this time.

As the aircraft commenced a crosswind turn, 15 seconds after the tower reported smoke, the pilot reported a loss of hydraulic pressure. The aircraft was at an altitude of about 500-700 feet. Forty-five seconds after reporting loss of hydraulic pressure and approximately halfway through the crosswind turn, the tail of the aircraft swerved violently left. Immediately after this, the left wing was seen to drop. The nose then dropped, and the aircraft entered a left spin, impacting the ground in an almost flat upright attitude, slightly nose low in a left skid. The aircraft came to rest about 3-5 feet left of the impact point and burst into flames. Witnesses confirmed that there was no fire or explosion in flight. All aboard the aircraft perished on ground impact.

Investigation revealed that the port engine failed in flight due to a fatigue failure of the crankshaft. It was also determined that the starboard hydraulic pump failed because of ingestion of two or more pieces of the hydraulic filler strainer screen retaining snapring. Small pieces of the ring lodged in the pump outlet check valve and prevented pressure from being developed. Pieces of the snapring were apparently inadvertently dropped into the main hydraulic reservoir by maintenance personnel while attempting to remove and replace the filler screen.

Maintenance personnel inspected 38 other squadron aircraft and found that the hydraulic filler neck screen (which prevents foreign objects from falling into the reservoir) was punctured in 19 aircraft. Turnaround/servicing MRC cards require filler screen inspection for puncture. This requirement had not been met prior to the mishap and the error was not detected by supervisory personnel. Thus, maintenance error was a contributing factor in this mishap.

Five minutes prior to the mishap, the instructor pilot had ordered a switch of student pilots. This was not considered a factor in the accident; however, it was concluded that there was a definite oversaturation of tasks in the cockpit in the final 2 minutes of the flight. The following is an analysis of the events preceding the crash:

A reliable witness reported that the port engine backfired several times just prior to the time the instructor feathered the engine and reported his emergency. Analysis of port engine oil revealed aluminum, iron, and silver levels above normal. There was a massive engine failure with sudden stoppage. One minute later, the pilot reported an unsafe gear indication. This short time period precluded completion of an engine shutdown checklist, as was also indicated by the position of switches (port oil cooler switch was ON, port generator switch was ON, port fuel selector ON).

In accordance with NATOPS, upon commencing the approach turn, the single-engine rudder assist switch should have been ON. The board determined starboard hydraulic failure had occurred by this time. Although the flap handle was found at 2/3 after the crash, it is believed that only 1/3 flaps remained due to loss of hydraulic pressure. Upon executing the waveoff, investigators believe necessary rudder control changes

depleted the rudder trimmer hydraulic pressure completely, permitting the lock arm return spring (bungee) to pull the rudder trimmer panel into the locked position. Duplication of the suspected failure on a squadron aircraft revealed that six minor movements of the rudder following main system hydraulic pressure failure will deplete trimmer pressure and the bungee will lock the trimmer panel into the centered position regardless of rudder pedal position, i.e., full right or left pedal deflection.

The tower report of smoke trailing from the starboard engine was an additional confusion factor for the pilot at this time. The pilot's realization and report of loss of hydraulic pressure shortly thereafter would have led to his turning off the rudder assist switch as prescribed by current NATOPS procedures. (The position of the rudder assist switch in the wreckage was OFF.) This would also have caused the trimmer panel to go to the neutral position and lock if it had not previously locked due to depletion of the hydraulic pressure in the trimmer actuator. Therefore, rudder reversal is believed not to have been a factor in this accident. (Impact marks substantiated this conclusion.)

Upon discovering the loss of hydraulic pressure, the emergency gear handle was apparently selected and the emergency hydraulic pump handle was placed in the actuating socket. Additionally, at this time the pilot was attempting to turn left downwind with a shallow angle-of-bank. It is believed that in an effort to maintain balanced flight, the instructor and the student were both holding right rudder. The oversaturation of cockpit tasks led to broken scan patterns, resulting in a reduction of aircraft airspeed to or near a stalled condition. At this time there was apparently a large reduction of power on the starboard engine which caused a violent swerve of the tail to the left. The aircraft stalled immediately and entered a left spin from which the pilot was unable to recover.

In summary, material failure and maintenance error precipitated the chain of events which led to this mishap. This placed the young, relatively inexperienced instructor pilot in a position where there was little room for error. Nevertheless, what might well have terminated in a single-engine landing turned into a fatal accident when the pilot became overly distracted from his main reason for being in the aircraft, i.e., to fly it first and do other things when able. As hard as it may sound, the point must be made that if a problem becomes so acute that the pilot-in-command, regardless of the reason, cannot cope with all the actions required to remain airborne, so be it. He must fly the aircraft to as safe a landing as possible, even if that means landing on other than a runway. Anything is preferable to a stall/spin and uncontrolled collision with the ground.

(Note: One of the possible complicating factors in this mishap was the location of the hydraulic pressure gages on the overhead panel. As a result of this mishap, TS-2A AFC 542 has been issued directing relocation of these gages to the main instrument panel in the TS-2A. Action to relocate gages in the US-2A/B/C is pending. – Ed.) ◄

Demon Mind Bender...

Get-home-itis

OK, class, everyone out of the pool. Pay attention. I've gathered all of you prop domes and rotor heads together to discuss a problem. If a majority can agree in principle, then I think we will have made a positive contribution to aviation safety.

Let's keep the priorities in perspective. The problem is this: What course of action could/would a prudent plane commander take if he thinks he might have zapped an object on the taxiway with a prop?

Here's what happened. The PPC of a P-3 was taxiing out for takeoff. While taxiing, the crew heard a buzzing sound, and the pilot noted and felt a momentary vibration of the No. 4 propeller lever.

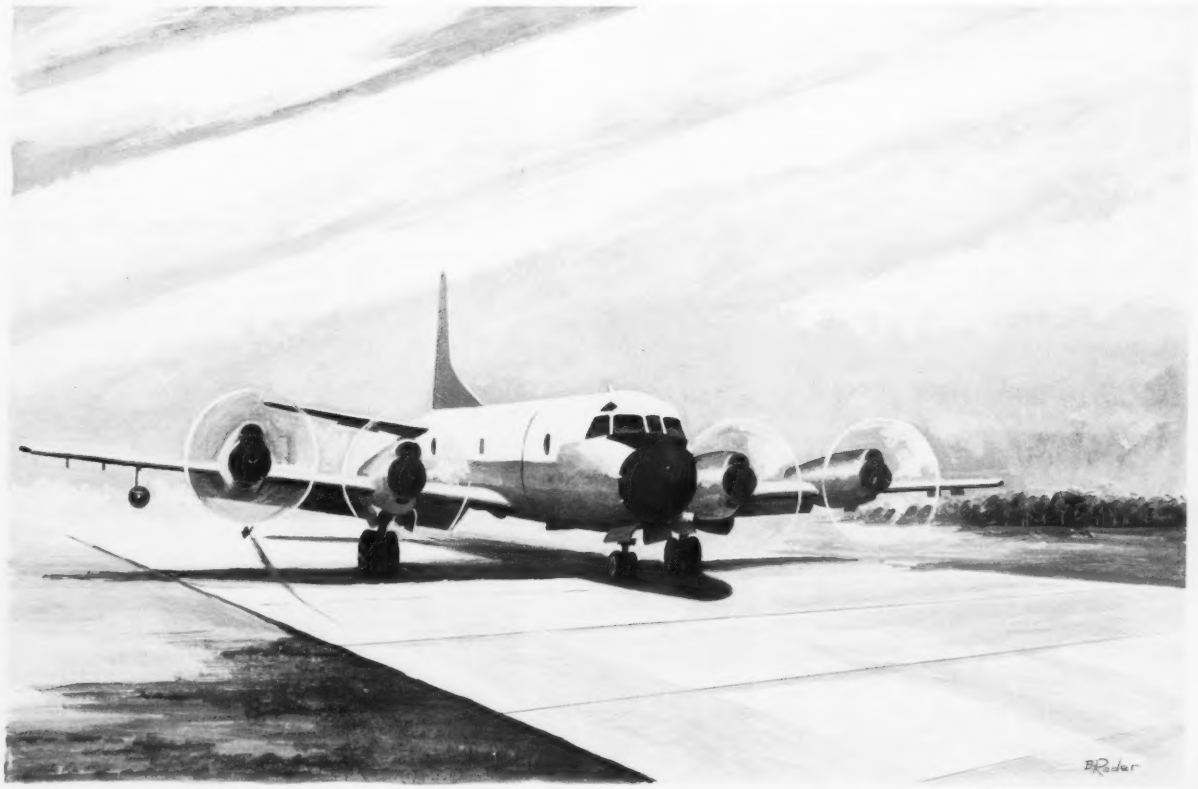
The PPC taxied to the runup area and executed a high-power turnup. All gages were reading normal, and there was no other evidence, visually or aurally, of anything wrong. While in the runup spot, they noted a small metal container, which they had passed on the taxiway, and the tower was requested to send someone out to check it.

In the meantime, the pilot's clearance came through, and off they went. They were heavy because they were going 2000 miles or more. They made one stop for fuel, cursorily checked the props, and headed for home.

A careful inspection of the propeller was made after arriving safely at Homeplate. The only damage of any kind was confined to the No. 4 prop. It had nicks in the blade tips, blade bending, and *the prop failed a blade alignment check.*

The squadron CO opined that the PPC allowed normal thought patterns to be blanked out by thoughts of having his dirty clothes washed. Why else would he violate NATOPS without some cover for his six?

Now, class, here's what I want you to do. You have all of the information just as it happened. Put yourself in the PPC's shoes. What's the course of action you'd have taken? ◄



Letters

A good listener is usually thinking about something else.
Ace L.

P-3 Wheels Warning

Los Angeles – As an FAA (Federal Aviation Administration) Airworthiness Inspector, I review your fine magazine for articles relating to air safety to both increase my knowledge and to determine if your experiences are relatable to civil operation.

In the August issue of APPROACH, your article, "Low, Low Approach," concerned a P-3C making a touchdown with the gear up. From the writeup, it is understandable how the crew got into the situation. However, it would be interesting to know why no warning horn is required when a landing flap is selected and the gear is not down and locked. This has been a civil requirement for many years and has been effective in reducing gear-up landing problems. If economy is a consideration, one scrap-iron landing of a megabuck airplane makes the warning system attractive by comparison.

J. C. Muir
FAA, Western Region

• The P-3 aircraft does not have a wheels warning horn. However, a red, flashing WHEELS warning light is located in the center of both the pilot's and copilot's instrument panels. The light is on and flashing any time the power levers are aft of the 41-degree coordinator position (7 degrees above the flight idle position) and the wheels are not down and locked, regardless of flap position. The light provides ample warning if it is on.

There are times during an approach when the power levers may not be retarded to a position that will activate the light; e.g., a lean fuel control, a heavy aircraft, a hot day, etc. Since a warning horn would be activated at about the same place on the power lever quadrant, it would be no more foolproof than the light.

Lockheed-California Co. engineers are presently investigating the feasibility of moving the power lever switch to correspond with a higher power setting and improving the system logic to provide a more reliable warning.

Re "Set Condition V"

FPO, New York – I enjoyed the subject article in the JUN '75 APPROACH. It was great, and it brought back nice memories of the time I spent in VP-30.

I have a comment about the third pilot. If he had enough time to think he'd missed the announcement, "Setting Condition V," or thought it had not been made, why didn't he ask the PPC what was cooking? There must have been some other goof, too. Even though no one suffered serious injury, someone could have been killed.

Paul E. Tomlinson

Navy Helicopter Association

Imperial Beach, CA – The Navy Helicopter Association is a nonprofit, professional, and social organization dedicated to furthering and promoting the use of helicopters in the maritime environment. The term "Navy" is used in its broad context which includes the U.S. Marine Corps, the U.S. Coast Guard, and other maritime services.

A major goal of the Navy Helicopter Association is to provide a forum for the exchange of information by both military and industry experts. It will be most appreciated if you would publish the following "call for papers":

"The Navy Helicopter Association invites representatives of industry and the military to submit papers for presentation at its annual symposium to be held in San Diego, CA, May 1976. Papers of both general and limited interest will be welcome on any subject related to helicopters and should not exceed 30 minutes. Audio and visual aids will be provided. Abstracts should be submitted to reach the Navy Helicopter Association, Naval Auxiliary Landing Field, Imperial Beach, CA 92032 (ATTN: LT Bruce M. Hoeller), not later than 1 February 1976. Authors of selected papers will be notified by 15 February 1976."

CDR R. L. Barton, USN
Chairman, Promotion Committee

"Aren't All Helicopters Alike?"

MCAS Beaufort,SC – The basic premise that all helicopters are not alike and shouldn't be tasked with missions that do not fit their capabilities is certainly true. However, there are some misleading statements in the article (APR '75 APPROACH) that should be clarified.

A fixed-wing pilot flying out of Beaufort, Cherry Point, or any other MCAS may be very distressed by reading the article, and rightfully so. These stations are converting to the HH-46A for the station SAR aircraft, a different aircraft completely.

Your article states that the H-46 is limited by NATOPS to day SAR only and has minimal night SAR capability. What is the fixed-wing reader to think? That he has no night SAR coverage? Not so! Although it's true that the UH/CH-46 is not authorized to perform night SAR missions, there is a new designation, the HH-46A, which has been refitted specifically for SAR

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request. Address: APPROACH Editor, Naval Safety Center, NAS Norfolk, VA 23511. Views expressed are those of the writers and do not imply endorsement by the Naval Safety Center.

operations. We are switching from a relatively simple helo, the HH-1K, with one engine, one pilot, no stabilization equipment, and no hover information, to the HH-46A. This helicopter boasts two engines, two pilots, ASE, doppler hover and groundspeed indicators, a built-in loud hailer system, and established NATOPS procedures for night and low visibility SAR operations.

Additionally, although the article was correct in stating that the H-46 is limited to 2 hours flight time between refuelings, an extended range internal tank is available and will soon be in use by SAR units. These tanks will almost double our flight endurance.

I feel it is important to make it clear that the SAR coverage we provide is not compromised by the aircraft we fly.

1stLT David O. Dresser, USMC
SAR Unit

• Cut it or spell it any way you like, the HH-46A has a limited, overwater, night SAR capability. You are correct that the HH-46A is a better SAR bird than the HH-1K, but the very fact that you do not have coupled doppler means you cannot comply with OPNAVINST 3710.7 under all circumstances. This does not preclude night SAR entirely, because you can function if you have outside reference to the horizon. However, the test pilot's report on night, overwater, uncoupled approaches indicates that it's a hairy maneuver – even for a second tour, Fleet-qualified pilot.

About "Nuggets"

Boulder, CO – Re "What's a Nugget?" in your SEP '75 APPROACH. A "nugget" has always meant a new ensign, derived, I believe, from new gold bars. From *Webster's:* "A lump of native gold yet to be molded." Our use of the term in naval aviation (for the past 27 years in my experience) could not be more appropriate.

Keep 'em flying.

CAPT George A. Carlton, USN
Office of PONS
University of Colorado

See next three letters.

NAS Willow Grove, PA – My first brush with the term "nugget" was my being called one when I was a second lieutenant with a nice, shiny bar which resembled a "nugget."

However, I heard the Skipper refer to a Captain as a "nugget" (an ex-officer student who had just reported from Pensacola). The Skipper explained that we were "nuggets" because our gold wings were so shiny they resembled a gold nugget. (Presumably, after one had picked up a little experience in the field, the wings became tarnished or the aviators stopped shining them.)

I'm certain you'll have your share of explanations of this well-used term in Marine Corps/Naval Aviation circles.

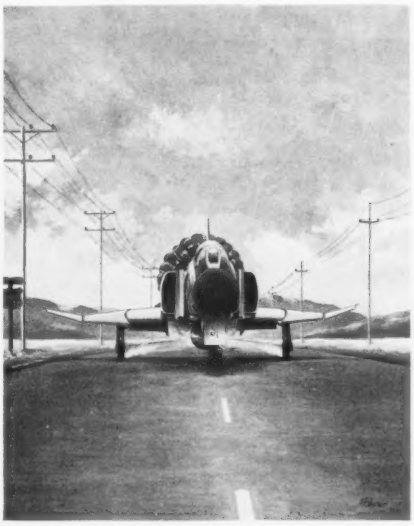
Col Marv Garrison, USMC
Commanding Officer
MAG-49, MARTD

Arlington, VA – I was a naval aviator during WW II, flying F-4Us for the Marines (VMF-914, Service Test at Pax River, VMF-115), and I never heard the term. I did hear it after the war, however, and it seemed to be in the context of golden wings that were mere nuggets of "new gold" rather than refined, old gold.

Charles C. Moore, Jr.
Administrative Law Judge
Office of Hearings and Appeals
U.S. Department of Interior

Philadelphia – When I was the legal officer aboard TICONDEROGA (CVA-14) from December 1962 to December 1964, one squadron in particular which I recall – VA-52 – used the term for first tour aviators. It was explained to me that it stood for "new guy."

CDR John J. Walsh, USN
Staff Legal Office
Headquarters, 4th Naval District



"King of the Road" (cont'd.)

NAS Lakehurst, NJ – While reading "King of the Road" in the AUG '75 APPROACH, one question kept popping into my mind: What was the external stores configuration of the aircraft? Did these gents jettison anything when they found themselves *in extremis* due to low fuel? *Phantoms* usually have enough "garbage" hanging on them to significantly alter their bingo profiles or endurance. The idea of jettisoning stores for fuel reasons is rarely addressed, since it is assumed that all missions are preplanned to preclude a fuel emergency. However, in such a situation, each pilot must be prepared to dump his empty tanks, blivets (sob!), racks, etc., early enough to make a difference. Recommend that all pilots understand the difference between clean and dirty aircraft fuel consumption so that they can put it to use if they are unfortunate enough to need it.

LT A. R. Merriam
ASO, NATF Lakehurst

• Your letter was referred to the pilot involved, who answered as follows:

"LT Merriam has a very good point and one which was brought up many times in our postincident discussions. Each of the three aircraft which ended up *in extremis* had the standard 600-gallon Royal Jet centerline installed. In addition, the No. 3 aircraft (which landed on the highway) was carrying a blivet hung from the No. 2 station. This, of course, was filled with clothing and personal items of value. To my knowledge, none of the pilots considered jettisoning their external stores. This was probably due to the problems encountered in getting vectors and in providing navigational and approach information from within the cockpit.

"It is quite amazing, I'm sure, to all F-4 pilots . . . the difference in ACM with a clean vice centerline-configured aircraft. This, as LT Merriam points out, is equally significant in an extreme low fuel situation. Of course, jettisoning of tanks, etc., over populated areas and through cloud layers could easily lead to incidents possibly as significant as the loss of an aircraft, so an aircrew must use correct judgment in this procedure also.

"In our situation, as it turned out, jettisoning stores would probably not have changed the outcome. However, next time it will certainly be on our minds to get rid of all that drag, if need be." ◄

Prop Community: SECOND RATE?

Naval Station, Rota, Spain – Ignorance and superstition have triumphed once again.

The fact that you printed the article entitled "A Very Forgiving Aircraft" in your SEP '75 issue drops the credibility of your magazine to a new alltime low – approaching unacceptable.

The contents of the article are of such low quality that it warrants absolutely no comment by any pilot.

The main point is that you allowed it to be printed even though it was based on extremely poor statistics, which any educated person knows can be bent to your liking, knowing full well that you would alienate the entire United States Navy "prop community." You did it anyway – that's the unbelievable part!

It may just be a continuation of the effort by the Navy to degrade the "prop community" as much as possible. Keep in mind that the "prop community" vice the "jet community" is purely a figment of the imagination of the United States Navy. In other military services, as well as in the real world, a pilot is a pilot is a pilot.

LCDR Al Herndon
VR-24 Det Rota

See next letter.

NAVSEC JUSMMAT, APO, New York – "There are three kinds of lies: lies, damned lies, and statistics." – Mark Twain.

Move over, Grampaw Pettibone! LCDR Russell's article, "A Very Forgiving Aircraft," APPROACH SEP '75, would give Twain further cause for indignation, along with every prop pilot (especially S-2 pilots) in the Navy for its damaging and destructive attack upon a proud and professional community through insinuation and inuendo. I am surprised APPROACH would print such vicious pettifoggery and poppycock. "Views of guest-written articles [may] not necessarily [be] those of NAVSAFECEN," but you do have a responsibility for what graces it with the prestige of its name!

The phrase " . . . more so in prop *communities* than in *the* jet *league,"* (italics mine) raises my dander. The blind prejudice in these labels and the context in which they appear is blatant. Without the benefit of the statistical data base for Fig. 1, or a knowledge of jets and their jocks, I'm concerned that the USN jet league's procedural errors *exceeds* that of the West German jet jocks by 25 percent. (Whereas USN prop pilots versus their W.G. counterparts is *lower* by as much.) The analysis of Fig. 1 reveals a very real weakness in the USN jet league and a laudable strength in the USN prop communities. Since USN jet pilots commit certain errors 25 percent more often than W.G. jet pilots, it is easy to say W.G. jet pilots are more professional in their flying. (As for the USN prop communities, no comment is necessary.)

Are such errors *by no means* nationalized? Procedural differences do exist even though the same aircraft is involved. As LCDR Russell points out, safety is an attitude; what bearing do cultural differences play? Believe me, it is a factor that weakens the comparisons drawn (literally and figuratively misleading) in Fig. 1.

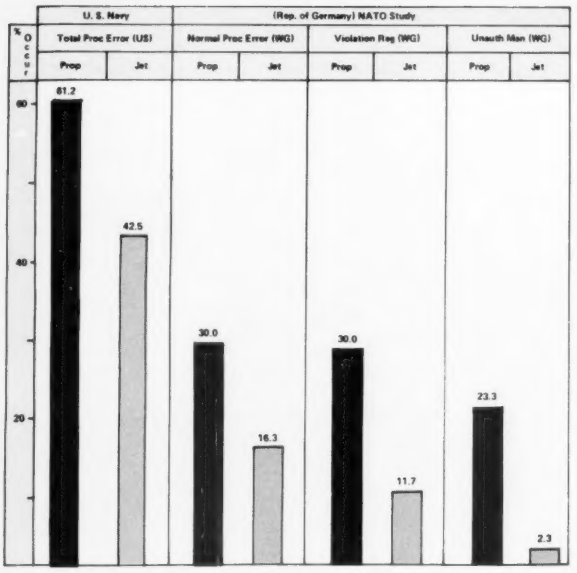


Fig. 1

Perhaps a prop pilot is stuck with his bird in a crisis – more so than the jet leaguers. Perhaps there's a little more to operating a piston engine and the options for tending to a problem more numerous, as opposed to pulling a face curtain for a fast exit.

Many's the time that a prop pilot probably wished he'd had the jet leaguer's boost from an afterburner, coyly called by some as "the eraser," for solving mistakes made close to the flight envelope.

This article would have been better left unwritten, as well as unpublished, but since the argument has been posed, why not punch that computer of yours and present a detailed statistical breakdown?

It would be appreciated in the future if a brief biography of the guest author could be presented so as to establish writing credentials.

Don't let the raised fur fool you! APPROACH still rates No. 1 as a monthly ride with the professionals.

LCDR Gary T. Dye
Senior Advisor

P.S. A few more stories about props would be appreciated; it seems that the jets are always getting your attention!

These were but a few samples of correspondence and conversations received about LCDR Russell's article. The article was intended to be controversial, but we didn't want to be *this* successful! Seriously, the staff of APPROACH and LCDR Russell meant no putdown of prop pilots whatsoever; in fact, LCDR Russell is from the prop community. In attempting to develop the main point of the article (that complacency in a prop aircraft can kill you just as surely as complacency in a jet), it was necessary to cite some statistics that may have portrayed a different meaning than was intended. For example, the fact that prop pilots make more procedural errors than jet pilots may be construed by some to mean that prop pilots are second rate. Not so. Prop pilots have to execute a far greater number of procedures for everything they do – from engine start to inflight emergencies – so, of course, numerically, they are going to end up with more procedural errors. One need only compare the accident rate of the prop community with the jet community to demolish the fallacy that prop pilots are an unprofessional, error-ridden group of aviators.

In an effort to shed further light on prop community procedural errors/mishap data, the Safety Center S-2 analyst is preparing an article based on a computer readout of prop community pilot error data. The results should shed further light on the subject and put the matter of prop procedural errors in a different perspective.

If any prop pilot was offended by any of the unintended insinuations that prop pilots are second rate, we sincerely apologize. Again, this was not the intent of the article, and the basic point of the article is: Regardless of your aircraft, respect it, don't be complacent, and be aware that a prop aircraft can kill you just as easily as a jet. No one can really dispute this.

If you ask enough people, you usually find someone who'll advise you to do what you were going to do anyway.

Ace L.

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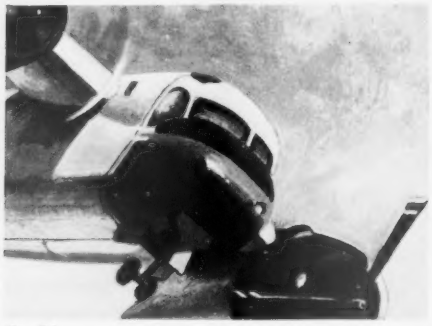

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CREDITS/McDonnell-Douglas artist R. G. Smith leads off the 1976 covers with a painting of two Marine Corps A-4Ms. This late model version of the durable *Skyhawk* forms the backbone of the Marine Corps' close air support forces.

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IN MEMORIAM

WILLIE EMMETT CUMBIE, JR.

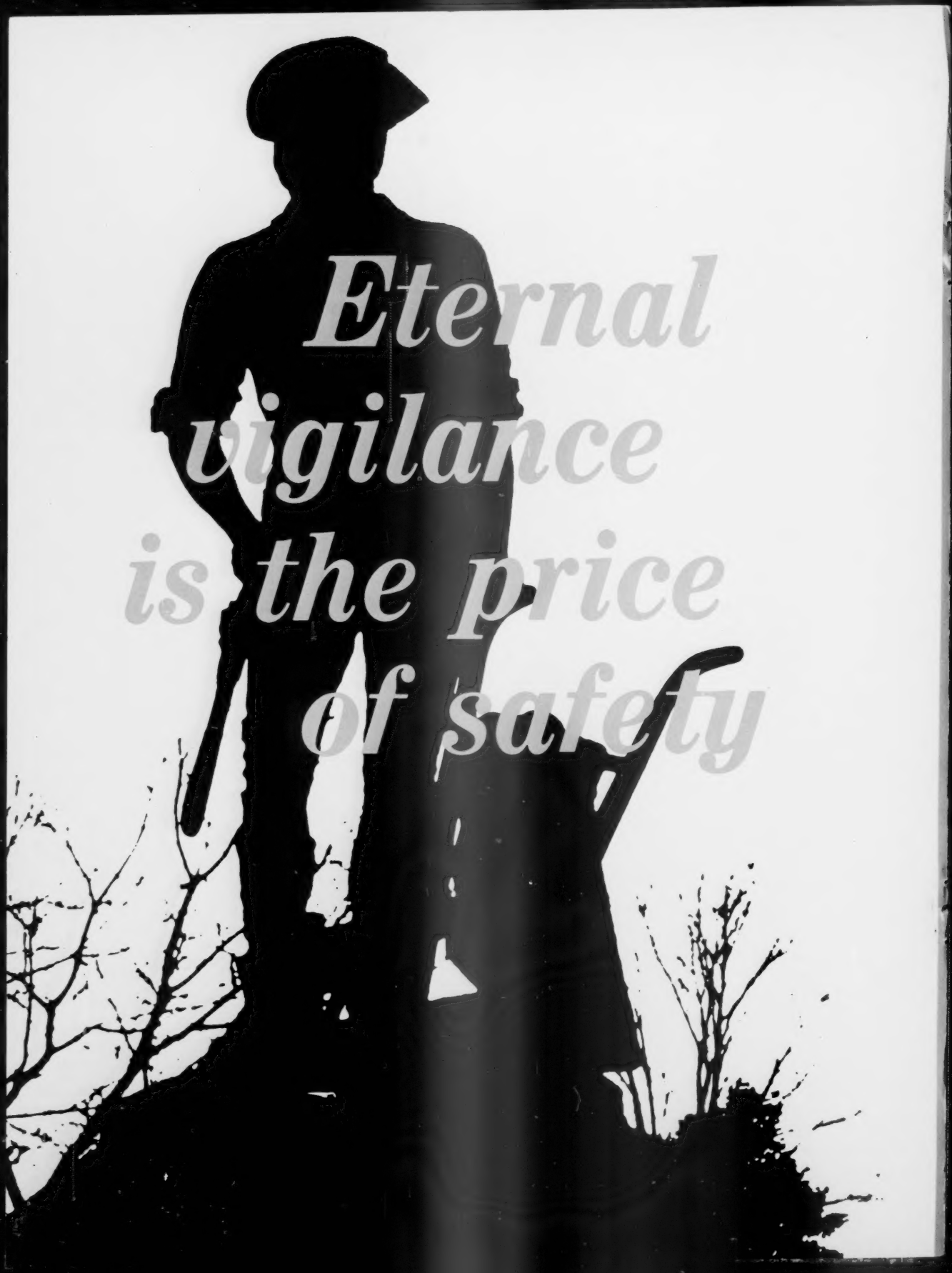
November 15, 1927 – November 30, 1975

LIEUTENANT Willie E. Cumbie, Jr., USNR (Ret.), Fixed Wing Writer for APPROACH and contributing writer for MECH died suddenly on 30 November 1975.

He was a native of Bainbridge, GA, and enlisted in the Navy in 1945. He was commissioned in 1954 after OCS and entered flight training in the fall of 1954. He received his wings in the spring of 1956 and served with VA-56, FAETUPAC, VA-126, and FASRON-12 during the next 4 years. He then requested release from active duty and worked for RCA at Thule, Greenland, for 2 years, but his love for flying prompted him to return to active duty. He served in the Training Command at NAS Whiting and NAS Pensacola from 1961 to 1967. During this tour he received the flight instructor's coveted 2000-hour, accident-free certificate. He retired in 1967.

Mr. Cumbie's distinguished writing career began while writing technical manuals for Hayes International Corporation. He started his career with APPROACH and MECH in the spring of 1968. Since that time his prodigious writing in APPROACH and MECH helped pass the safety word and contribute to a lower Navy accident rate nearly every year. He was the author of the feature article in APPROACH for most of the issues since 1969. During his career, APPROACH received numerous Chief of Naval Information merit awards, due, in large part, to his invaluable work.

Naval aviation safety has lost a champion in the death of this talented man, but his contributions will remain for a long time.


Eternal
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